



# ELPROM

Industrial Electric  
EXPLOSION PROOF  
**MOTORS**  
**EB3**

EQUIPMENTS DESIGNED FOR POTENTIALLY EXPLOSIVE ATMOSPHERES



## ELPROM

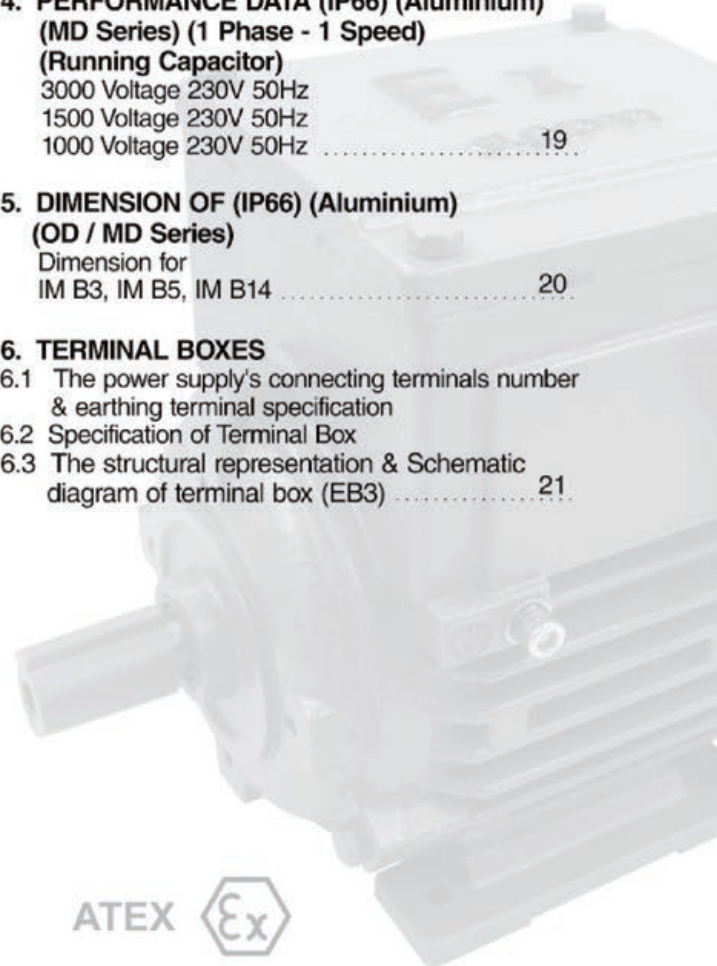
Cast Iron Series Motor  
71~355

Aluminium Series Motor  
56~132

• II 2G Ex d • II 2G Ex de • II 2GD Ex d Ex tD A21 • II 2GD Ex de Ex tD A21 •

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## ELPROM MOTORS

Guaranteed security against explosion of dangerous dusts & gasses at all industry field

## 1. PRODUCTS QUALITY & CERTIFICATES



International Protection Rating certified  
by CONSORZIO EUROPEO CERTIFICAZIONE (ITALY)



**CE**  
Organismo Notificato n. 1131

**Ex**

(1) **CERTIFICATO DI ESAME CE DEL TIPO (AII, III)**  
EC-TYPE EXAMINATION CERTIFICATE (AII, III)

(2) **Apparecchio o Sistema di Protezione inteso per l'uso in atmosfere potenzialmente esplosive, Direttiva 94/9/CE**  
Equipment or Protective System intended for use in Potentially Explosive Atmospheres, Directive 94/9/CE

(3) **Certificato di Esame CE del Tipo numero.....** CEC 13 ATEX 172  
EC-Type Examination Certificate number..... 130219-ATEX195

(4) **Apparecchio o Sistema di Protezione.....** Motor EB3... series  
Equipment or Protective System.....

(5) **Costruttore.....** ELPROM MOTOR INDUSTRIES (M) SDN BHD  
Manufacturer.....  
**Indirizzo.....** 9, Jalan 6/2B, Taman Industri Selesa Jaya,  
Address..... Batukong  
43300 Seri Kembangan  
Selangor Darul Ehsan, MALAYSIA

(7) Questo apparecchio o sistema di protezione ed ogni sua variante approvata è descritto nell'allegato al presente certificato e nei documenti descrittivi in esso richiamati.  
This equipment or protective system and any acceptable variation thereof is specified in this certificate and the documents therein referred to.

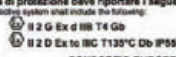
(8) Il CEC, organismo notificato n° 1131, in conformità all'articolo 9 della Direttiva 94/9/CE del Consiglio dell'Unione Europea del 23 Marzo 1994, certifica che questa apparecchiatura o sistema di protezione è conforme ai Requisiti Essenziali di Sicurezza e Salute per il progetto e la fabbricazione di apparecchiature e sistemi di protezione destinati ad essere utilizzati in atmosfere potenzialmente esplosive, definiti nell'Allegato II della Direttiva.  
CEC, notified body No. 1131, in accordance with Article 9 of the Council Directive 94/9/CE of 23 March 1994, certifies that the equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

(9) I risultati dell'esame e dei test sono descritti nel rapporto confidenziale elencato nella sezione 16. L'esecuzione e i test sono descritti in rapporti confidenziali elencati nella sezione 16.  
The examination and test results are recorded in confidential reports listed in section 16. Compliance with the Essential Health and Safety Requirements has been assured by compliance with IEC 60079-0: 2011, IEC 60079-1: 2007, IEC 60079-31: 2008

(10) La conformità ai Requisiti Essenziali di Sicurezza e Salute è assicurata dalla conformità alle: **IEC 60079-0: 2011, IEC 60079-1: 2007, IEC 60079-31: 2008**  
If standards not listed in the list of Annex Harmonized Standards are used, compliance to the Essential Health and Safety Requirements is verified anyway.

(11) Il simbolo "X" posto dopo il numero del certificato indica che l'apparecchiatura o il sistema di protezione è soggetto a condizioni speciali per un utilizzo sicuro, specificate nell'allegato al presente certificato.  
If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(12) Questo Certificato di esame CE del Tipo è relativo soltanto al progetto, agli esami ed alle prove dell'apparecchio o sistema di protezione specificato in accordo con la Direttiva 94/9/CE. Ulteriori requisiti di questa Direttiva si applicano al processo di produzione e fornitura dell'apparecchiatura o sistema di protezione. Questi requisiti non sono oggetto del presente certificato.  
This EC-Type Examination Certificate relates only to the design, construction and tests of the specified equipment or protective system in accordance to the Directive 94/9/CE. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

(13) L'apparecchiatura o sistema di protezione deve riportare i seguenti contrassegni:  
The marking of the equipment or protective system shall include the following:  


Legnano, 29 novembre 2013  
Il Direttore Tecnico (A. PUGLISI)  
Il Direttore Generale (L. MASSESI)

CONSORZIO EUROPEO CERTIFICAZIONE  
L'ORGANO DELIBERANTE

CEC - CONSORZIO EUROPEO CERTIFICAZIONE S.C.A.R.L.  
Sede Legale e Uffici: Via Piaccane, 46-20025 LEGNANO (MI) Italy - tel. +39 0331 442 266- fax +39 0331 440 054  
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**CE**  
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(3) **Certificato di Esame CE del Tipo numero.....** CEC 13 ATEX 173  
EC-Type Examination Certificate number..... 130219-ATEX196

(4) **Apparecchio o Sistema di Protezione.....** Motor EB3... series  
Equipment or Protective System.....

(5) **Costruttore.....** ELPROM MOTOR INDUSTRIES (M) SDN BHD  
Manufacturer.....  
**Indirizzo.....** 9, Jalan 6/2B, Taman Industri Selesa Jaya,  
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(13) L'apparecchiatura o sistema di protezione deve riportare i seguenti contrassegni:  
The marking of the equipment or protective system shall include the following:  


Legnano, 18 dicembre 2013  
Il Direttore Tecnico (A. PUGLISI)  
Il Direttore Generale (L. MASSESI)

CONSORZIO EUROPEO CERTIFICAZIONE  
L'ORGANO DELIBERANTE

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### Product Standard:



## 2. TOLERANCES AND STANDARDS OF REFERENCE



### 2.1 Mechanical & Electrical Tolerances

Symbol	Description	Tolerance
A	Distance between centre-lines of fixing holes (end view)	± 1mm
AB	Overall dimensions across the feet (end view)	+ 2%
AC	Diameter of the motor (without terminal box)	+ 2%
B	Distance between centre-lines of fixing holes (side view)	± 1mm
C-CA	Distance from the shaft end shoulder to the centre-line of nearest mounting holes in the feet	± 3mm
D-DA	Diameter of the shaft extension,	Ø11 – 28 j6
		Ø32 – 48 k6
		Ø ≥ 55 m6
E-EA	Length of the shaft extension from the shoulder	Ø < 55mm - 0,3mm Ø > 60mm + 0,5mm
F-FA	Width of the key way of the shaft extension	h9
GA-GC	Distance from the top of the key to the opposite surface of the shaft extension	+0,2mm
H	Distance between the centre-line of the shaft to the bottom of the feet	Ø ≤ 250 - 0,5mm
		Ø ≥ 280 - 1mm
HD	Distance from the top of the terminal box and to the bottom of the feet	+2%
K	Diameter of the holes or width of the slots in the feet of the motor	+3%
L	Overall length of the motor with a single shaft extension	+1%
M	Pitch circle diameter of the fixing holes	±0,8mm
N	Diameter of the spigot	Ø < 230 j6
		Ø i 250 h6
P	Outside diameter of the flange	±1mm
R	Distance from the shaft shoulder to the mounting surface of the flange	±3mm
S	Diameter of the fixing holes in the mounting flange or nominal diameter of thread Distance from the shaft shoulder to the mounting surface of the flange with locked bearing	+3%
		± 0,5mm
	Mass of motor	-5 a + 10%
	Nominal voltage, $V_N$	± 5%
	Efficiency, $\eta$	-15% of (1- $\eta$ )
	Power Factor, $\cos\phi$	-1/6 of (1- $\cos\phi$ ) min 0.02, max 0.07
	Slip (rpm) (full load & nominal ambient temperature), $P_N$	±20% if PN i 1kW ±30% if PN< 1kW
	Locked rotor current, $I_A$	±20%
	Locked rotor torque, $M_A$	-15% +25%
	Breakdown torque, $M_{max}$	-10% con $M_{max}/M_N \geq 1.6$
	Minimum torque, $M_{min}$	-15%
	Moment of Inertia, J	±10%
	Sound intensity level (sound pressure) $L_{pA}$	+3 dBA

### 2.2 Standards of reference

Title		EU CENELEC	International IEC
Rotating Electrical Machines	Part 01: Rating & Performance	EN 60034-1	IEC 60034-1
	Part 02-1: Standard methods for determining losses & efficiency from tests (excluding machines for traction vehicles)	EN 60034-2	IEC 60034-2
	Part 05: Degrees of protection provided by the integral design of rotating electrical machines (IP code), Classification	EN 60034-5	IEC 60034-5
	Part 06: Methods of cooling (IC code)	EN 60034-6	IEC 60034-6
	Part 07: Classification of types of construction, mounting arrangements & terminal box position (IM code)	EN 60034-7	IEC 60034-7
	Part 09: Noise limits	EN 60034-9	IEC 60034-9
	Part 12: Starting performance of single-speed three-phase cage induction motors	EN 60034-12	IEC 60034-12
	Part 14: Mechanical vibration of certain machines with shaft heights 56mm & higher - Measurement, evaluation & limits of vibration severity	EN 60034-14	IEC 60034-14
	General purpose three-phase induction motors having standard dimensions & output, Frame No, 56 to 315 & flange No, 65 to 740	EN 50347	IEC 60072-1
	Degree of protection provided by enclosures (IP code)	EN 60259	IEC 60529
Electrical apparatus for explosive gas atmospheres	Part 00: General requirements	EN 60079-0	IEC 60079-0
	Part 01: Flameproof enclosures "d"	EN 60079-1	IEC 60079-1
	Part 07: Increased safety "e"	EN 60079-7	IEC 60079-7
Explosive atmospheres	Part 31: Equipment dust ignition protection by enclosure "t"	EN 60079-31	IEC 60079-31

**3. GUIDE TO MOTOR CHOICE**



**First step is the classification of hazardous places in zones.  
 The end user shall classify the hazardous areas under his own responsibility.**

Directive 1999/92/EC provides information regarding "Classification of places where explosive atmosphere may occur". The corresponding standards of reference are EN 60079-10 for gas & EN 61241-10 for dust.

Here below are the synthetic step-by-step guide to choice of the motors. *We will highlight all the characteristics of our motors.*

ZONE CLASSIFICATION (presence of explosive atmosphere)		(1) Group	(2) Category	(3) Type of protection	(4) Gas group	IP Degree	(5) GAS Temperature Class (6) DUST Surface Temperature
<b>GAS</b>	0 Present continuously or for long period	II	1G	Electrical apparatus not allowed			
	1 Occur in normal operation occasionally	II	2G	<b>Ex e</b> : "Increased Safety"	IIA, IIB, IIC	IP55	T1 = 450°C T2 = 300°C T3 = 200°C T4 = 135°C T5 = 100°C T6 = 85°C
				<b>Ex d</b> : "Frameproof Enclosure"			
2 Rarely occur in normal operation & for short period	II	3G	<b>Ex nA</b> : "Non Sparking"	IIA, IIB, IIC	IP55	T1 = 450°C T2 = 300°C T3 = 200°C T4 = 135°C T5 = 100°C T6 = 85°C	
<b>POLVERI</b>	20 Present continuously for long period	II	1D	Electrical apparatus not allowed			
	21 Occur in normal operation occasionally	II	2D	<b>Ex tb</b> : "protection by enclosure t"	IIIC, IIIB, IIIA	IP6X	T 125°C
	22 Rarely occur in normal operation & for short period	II	3D	<b>Ex tc</b> : "protection by enclosure t"	IIIB, IIIA	IP5X	

1.) **Group II** Comprises equipment intended for use in other places likely to become endangered by explosive atmosphere (surface plants different from mines).

2.) **Group II is sub-divided in to 3 categories:**

**CATEGORY I**  
 Very high level of protection

**CATEGORY II**  
 High level of protection

**CATEGORY III**  
 Normal level of protection

**G** Explosive atmosphere consisting of a mixture with air & flammable substances in the form of gas, vapour or mist

**D** Explosive atmosphere in the form of a cloud of combustible dust in air

3.) **ELPROM Motors O ~ M series will have the following types of protection:**

**Ex d** Motor & Terminal box (GAS)

**Ex de** Motor Ex d & Terminal board Ex e (GAS)

**Ex tb** Protection by enclosure (DUST)

4.) **GAS Group**  
**IIC** - Hydrogen, Acetylene, Carbon Disulfide  
**IIB** - Diethyl Ether, Ethylene etc..  
**IIA** - Propane, Butane, Pentane, Natural Gas etc..

**DUST Group**  
**IIIC** - Typical Gases: Hydrogen, Acetylene  
**IIIB** - Typical Gases: Diethyl Ether, Ethylene  
**IIIA** - Typical Gases: Propane, Butane

5.) **(GAS)** In function of their maximum surface temperature the motors are classified in a **TEMPERATURE CLASS**.

6.) **(DUST)** The **SURFACE TEMPERATURE** must be less or equal than the minimum value between Tmax1 e Tmax2 where:

$T_{max1} = 2/3 \cdot T_{cl}$  with  $T_{cl}$  ignition temperature in °C of the dust cloud.

$T_{mas2} = Tl - 75^{\circ}C$  with  $Tl$  ignition temperature in °C of a 5mm layer of dust.



**Danger**  
 Explosive material

**GAS - Main inflammable substances**

Inflammable substance	Group of GAS	Temperature of ignition	Temp. Class	Inflammable substance	Group of GAS	Temperature of ignition	Temp. Class
2-Methylpentane	IIA	300	T2	Ethyl formate	IIA	440	T2
Amyl acetate	IIA	360	T2	Methyl formate	IIA	450	T1
Butyl-n acetate	IIA	425	T2	Natural gas	IIA	482	T1
Ethyl acetate	IIA	426	T2	Isobutane	IIA	460	T1
Isobutyl acetate	IIA	420	T2	Isoheptane	IIA	220	T3
Methyl acetate	IIA	502	T1	Isohexane	IIA	264	T3
Propyl acetate	IIA	430	T2	Isooctane	IIA	410	T2
Vinyl acetate	IIA	425	T2	Isoprene	IIA	220	T3
Acetone	IIA	465	T1	Methane	IIA	537	T1
Methanol	IIA	464	T1	Methylcyclopentane	IIA	258	T3
Bromothane	IIA	511	T1	Methylamine	IIA	430	T2
Butane	IIA	287	T3	Methylmetacrylate	IIA	430	T2
Butane - 1	IIA	384	T2	Paraldehyde	IIA	239	T3
Butane - 2	IIA	325	T2	Pentane	IIA	258	T3
Cyclohexano	IIA	259	T3	Pyridine	IIA	483	T1
Cyclohexanol	IIA	300	T2	Propane	IIA	470	T1
Cyclohexanone	IIA	419	T2	Propylamine	IIA	318	T2
Cyclohexene	IIA	244	T3	Propylbenzene	IIA	450	T1
Cyclopropane	IIA	498	T1	Propylene	IIA	455	T1
Cymene (p)	IIA	436	T2	Styrene	IIA	490	T1
Chloro-benzene	IIA	637	T1	Toluene	IIA	480	T1
Acetyl chloride	IIA	390	T2	m-Xylene	IIA	522	T1
Allyl chloride	IIA	390	T2	o-Xylene	IIA	464	T1
Chlorbutane	IIA	240	T3	p-Xylene	IIA	528	T1
Chloroethane	IIA	495	T1	1,2 Butadiene	IIB	430	T2
Vinyl chloride	IIA	472	T1	1,3 Butadiene	IIB	430	T2
Dichlorobenzene	IIA	648	T1	Dioxane	IIB	245	T3
Dichloroethylene 1,1	IIA	570	T1	Diethyl ether	IIB	160	T4
Dichloroethylene 1,2	IIA	441	T2	Ethyl vinyl ether	IIB	200	T3
Diethylamine	IIA	312	T2	Methyl vinyl ether	IIB	350	T2
Dimethylamine	IIA	400	T2	Acrylate ethyl	IIB	350	T2
Dimethylaniline	IIA	371	T2	Ethylene	IIB	425	T2
Dimethylbutane 2,3	IIA	405	T2	LPG	IIB	365	T2
Dimethylpentane 2,3	IIA	330	T2	Sulphurated Hydrogen	IIB	260	T3
Heptane	IIA	215	T3	Methylacrylate	IIB	415	T2
Hexane	IIA	233	T3	Carbon monoxide	IIB	605	T1
Heptane	IIA	515	T1	Ethylene oxide	IIB	435	T2
Ethylacetoacetate	IIA	350	T2	Propylene oxide	IIB	430	T2
Ethylamine	IIA	385	T2	Acetylene	IIC	305	T2
Ethylmercaptane	IIA	295	T3	Hydrogen	IIC	500	T1
Butyl formate	IIA	320	T2	Carbon disulfide	IIC	95	T6

**DUST - Main inflammable substances**

Substance	Medium largeness particles (mm)	LEL (g/m <sup>3</sup> )	Cloud ignition Temp. T <sub>cl</sub> (°C)	Layer 5mm thick ignition Temp. T <sub>l</sub> (°C)
<b>Metals, Alloys</b>	Aluminium	10	560	430
	Bronze	18	750	260
	Iron	12	500	>450
	Graphite	7	30	600
	Lamp-black (carbon black)	13	15	620
	Sulphur	20	30	280
<b>Wood, products of wood, fibres</b>	Paper		100	620
	Cellulose (93% sweet wood, 6% hard wood)	14	15	420
	wood flour	60		470
	Wood (50% pear tree and 50% kernel)	35	100	500
	Wood (beech)	61		490
	Wood (pear tree)	27	100	500
	Sawdust of wood	65		470
	Cork	42	30	470
<b>Agricultural products</b>	Cacao	3	125	460-540
	Coffee	10	25	360
	Cereals (mixed powders)	37	125	510
	Wheat flour	56 - 125	60	480
	Soy flour	20	200	620
	Gelatine	65	60	560
	Wheat		100	470
	Dry milk	165	60	460
	Milk sugar	22	60 - 125	450
	Rye			415-470
	Buttermilk	400		450
	Tobacco		60	485
	Black tea	76	125	510
	Sugar	32	30	360
	Powdered sugar	17	60	350

**4. MOTORS CHARACTERISTICS**



**4.1 Range of Motors**

Ex ELPROM motors are manufactured in compliance with all the European standards concerning equipment and protective systems for potentially explosive atmosphere in compliance with the European Directive ATEX 94/9/CE (better known as ATEX).

In the table below are the range of motors for each type of protection.

In the following pages are the testing and certificates, main features of these motors and options available, subject to the type of protection.

**Range of Motors**

Type	Frame Size	Pole No	Output Range (kW)	Type of Protection	Temperature Class Surface Temperature	Tamb Max Range
<b>3-ph (*) 1 Speed</b>	56-132	2	0,12-11	Ex d Ex de	T3 T4 T5	Ta -40°C +60°C Ta -40°C +60°C Ta -40°C +60°C
	56.132	4	0,12-9,3			
	56-132	6	0,18-5,5	Ex tb	T125°C	Ta -40°C +50°C
	71-132	8	0,18-3			

(\*) If provided of Terminal Protection (Normally PTC) inside the windings, can be driven by frequency converters.

(\*\*) The capacitor of the phase motors is put inside a special Ex d cylindrical enclosure fitted on the motor itself. Otherwise it must be placed in a safe area.

**4.2 Testing and certificates**

Motors for hazardous areas have to be officially approved by a recognized test organization, authorized to issue test certificates, to ensure compliance with standards for this type of equipment.

Motors are defined and classified according to the categories and protection type which are defined in the corresponding standards.

The Ex motors built by ELPROM are manufactured in compliance with all the European standards concerning equipments & protective systems for explosive atmosphere as requested by the European Directive 94/9/CE (better known as ATEX Directive).

The motors have been tested by a Notified Laboratory which released:

**EC Type Certificate**

It means that all the Ex motors are manufactured in compliance with the technical drawings and documents approved by the Notified Body after testing the motors (performing type test as written in the EN standards) and the

**Product Quality assurance Notification**

production of such motors follows all the procedures requested by the Directive. Every year the Production of Ex motors is valued by a Notified body to verify that all the procedures are constantly respected.

Each motor or batch of motors will be despatched together with the following documents:

*EC Declaration of Conformity*

*Installation Manual and Safety Instructions, stating all important notes on the type/s of protection of the motors.*

### 4.3 Main Features

ELPROM Ex electric motors are manufactured and tested in compliance with all the EN/IEC standards and also in compliance with the main European Directives. First of all the directive 94/9/EC (ATEX as already explained), 2004/108/EC (EMC Electro Magnetic Compatibility), 2006/42/EC (Machinery Directive), 2002/95/EC (RoHS).

#### ATEX Characteristics:

Suitable for Surface plants different from mines (Group II)

<b>Presence of GAS :</b> Zone 1	<b>Presence of DUST :</b> Zone 21 and Zone 22
<b>Type of protection :</b> 'Ex d' or 'Ex de'	<b>Dust group :</b> IIIC, IIIB, IIIA
<b>Gas group :</b> IIC, IIB and IIA	<b>Type of protection :</b> Ex tb IP66 (IP65 for Ex de)
<b>Temperature class :</b> T3, T4, T5 (also suitable for T2, T1)	<b>Surface Temperature :</b> T125°C
<b>Ambient temperature range :</b> -40°C +60°C for temperature class T3	<b>Ambient temperature range :</b> -40°C +60°C
-40°C +60°C for temperature class T4	
-40°C +60°C for temperature class T5	

All the motors are asynchronous with squirrel cage rotor, wound stator, closed and externally ventilated in compliance with EN 60034-6 (IC 411).

#### The Supply Voltages

allowed to exceed the nominal value of  $\pm 5\%$ .  
All the electrical and mechanical features & the testing methods comply with the standard EN 60034-1.

#### The Power Ratings & the Dimensions

of the motors comply with EN 50347 and IEC 60072-1, the mounting arrangements B3, B5, B14 comply with EN 60034-7. All the geometrical dimensions are unified according to the tables UNEL 13113-71; 13117-71; 13118-7; IEC 60072-1.

#### The IP Degrees of Protection

of the motors comply with EN 60034-5 and EN 60259.

#### Insulation Class

All the motors have an insulation class F in compliance with EN 60034-1. Insulation class H on request.

#### The Bearings

are high-quality single row deep grooves ball bearings, pre-loaded by a wave spring.

#### Duty

The motors are normally made for S1 duty; otherwise intermittent duties can be provided on request after performing the heating tests.

#### Windings

Made of enamelled copper wires, insulated with two layers (insulation class H). They are painted with another layer of varnish and after this placed in an oven for the drying process.

It is also possible to tropicalize the windings using special additional varnish with high hygroscopic characteristics so to be used in places with an humidity  $> 60\%$  (see options)

#### Rotors

Die-cast aluminium squirrel cage or aluminium alloy (Al-Si Silumin).

#### The Shafts

of the motors and the keys-shaft comply IEC 60072-1. Special shaft are made on request (see options).

#### Frame

(in compliance with EN 50347)  
Die-cast aluminium with high mechanical strength, with a good thermal conductivity and light weight.  
The feet can be mounted on the motor frame in 3 different positions, in the bottom or on right and left side.

#### Terminal Box

The terminal box of motor B3 is fixed on the top of the motor. At the same time, the terminal box has cable entries in four different positions"

#### Flanges and Shields

(in compliance with EN 50347)  
Die-cast aluminium, with dimensions as per standard IEC 60072-1, or with special shapes on request:  
The motor is completely modular so that the flanges can be mounted or removed depending on the needs without affecting the Ex type of protection (as the flange are mounted on the front shield).

#### Ventilation

(in compliance with EN 60034-6)  
Self-ventilated motors IC 411. Depending on the type of protection the fan can be in plastic or in aluminium.

Ex d, Ex de : Plastic fan  
Ex tD A21 : Antistatic plastic or aluminium fan

#### Fan Cover

Zinc-plated steel sheet.

#### Noise

in compliance with EN 60034-9



## 4.4 Main Options



### Axially Locked Shaft

Motors with a locked bearing on the front shield using an elastic metal ring. This solution is necessary in case of alternative axial stress (ie. Bevel gear pinion with alternative load or motion, frequent start-up under load or with high inertia) so to create axial movement of the shaft and bumps on the bearings.

### Low Temperatures Motors (-40°C)

They have to be fitted with special bearing, metallic fan, metallic cable gland and plugs or made with special plastic materials.

In these cases, if there is a risk of condensation, it is better to fit the motors with "anti-condensation heaters".

### Anti-Condensation Heaters (Option)

For motors installed in cold and wet places, with significant temperature ranges, moisture condensation can be dangerous for the resistance of the winding insulation.

Upon request, we can apply appropriate heaters directly on the heads of winding.

The terminals are connected to a terminal board inside the connection box of the motor.

The heaters are available at 110V & 220V, with a tolerance of +/- 10%.

### Tropicalization of Windings

If the motors are installed outdoors or in high humidity areas, the windings may be tropicalized with a special varnish with high hygroscopic characteristics in order to protect the insulation materials by the condensation. This protection avoid the reduction of the insulation properties of the windings.

### Inverter Duty Motors

All these motors can be driven by a converter. In this case they must be fitted with thermal protections inside the windings.

### Special Voltages & Frequencies

The standard three phase motors are produced at the following nominal voltages and frequencies: 230 / 400 V, 50 Hz.

The motors can run at a different nominal voltage with a tolerance of +/- 5%.

On customer request, we can produce motors with special voltage and frequency.

### Special Shafts

On customer request, it is possible to supply motors with special shaft (according to the customer drawing).

It is necessary to send the drawing to our Technical Department for a feasibility study.

It is possible to supply motors with shaft of different material from the standard (C40), using Stainless Steel or others with standard or special dimensions.

### Special Flanges

Special flange available upon request, due to the modular flange assembling allows it.

### Rain Fan Cover (Option)

For outdoor applications, vertical mounting, DE shaft down (V5, V1, V18).

It is suggested to assemble a special cowl with a rain cover. It is available for all the frame sizes.

### Thermistors (PTC Positive Temperature Coefficient)

They must be used in case of motors driven by inverters.

They are fitted inside the windings in number of 3 with a series connection to be connected to an appropriate tripping device that cut off the motors supply in case the winding reach the thermal probe limit temperature.

Protectors will be available upon request, with different temperature setting in respect of the maximum Temperature class or surface temperature of the motor.

### Thermal Cut-off (Option) (Bimetallic Probes)

Motors with 1 or 2 thermal protectors with normally closed contact in series connection into the winding.

The series of contact shall be connected to an appropriate tripping device that cut off the motors supply in case the winding reaches the thermal probe limit temperature.

On request protectors will be available with different temperature setting in respect of the maximum Temperature class or surface temperature of the motor.

### PT100 (Option)

It is a device that increase its resistance according with the increasing of the temperature.

It is useful for continuous measuring of the winding temperature, properly connected to an electronic equipment.

### Casing Material (Against Corrosion)

The ELPROM motors have die-casted aluminium components & sandblasted. If it is not requested, the motors are supplied unpainted.

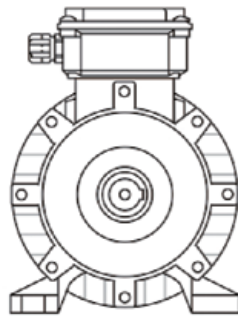
## 4.5 Motor Identification



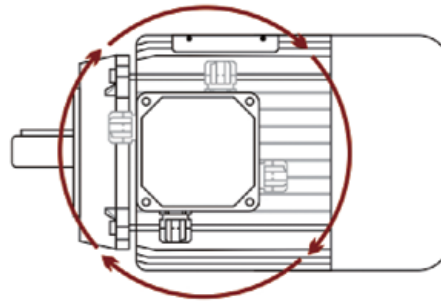
**5. TERMINAL BOX, CABLE ENTRIES & CONNECTIONS**



The terminal box is fixed on the motor top. (see picture 1).



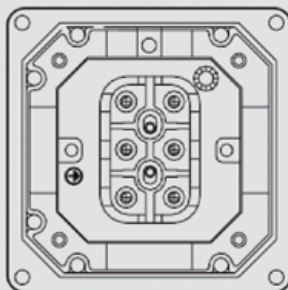
(Picture 1)



(Picture 2)

As the terminal box has four different entries position, it allow cable entry where it is necessary. (see picture 2).

**5.1 Cable connection on the terminal board**



- ..... Nut
- ..... Spring Washer
- ..... Washer
- ..... Connecting Plate
- ..... Terminal
- ..... Nut
- ..... Terminal Board

**Motors 'Ex de'**

The flameproof motors with increased safety terminal box are built with a special terminal board & the cable glands shall be certified in compliance with EN 60079-7.

In the picture you can see the special terminal board complying with EN 60079-7.

In case of motor fitted with thermal protection heaters etc, the wires of these devices will be connected when possible to the auxiliary pins of a 8 pins terminal board.

If it is not possible, they must be connected to the cable by welding the wires of the device to the cable wires and insulating them using a thermos sheath.

**Motors 'Ex d'**

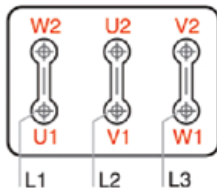
For these type of motors there is no need of a special terminal board & the cable glands shall be certified in compliance with EN 60079-1.

**5.2 Wiring Diagrams**

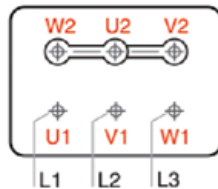
Shaft Side View

**3 PHASE / 1 SPEED**

*Delta Connection  
(Lower Voltage)*

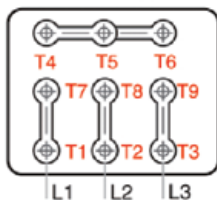


*Star Connection  
(Higher Voltage)*

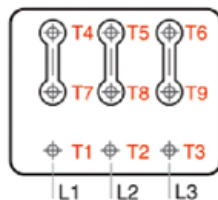


**3 PHASE / 1 SPEED / (9 WIRES)**

*Lower Voltage*



*Higher Voltage*

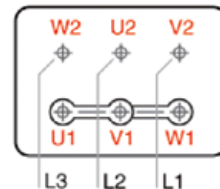


**3 PHASE / 2 SPEEDS / 1 WINDING DAHLANDER**

*Lower Speed*

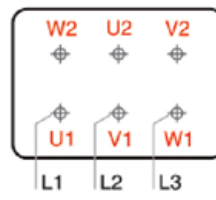


*High Speed*

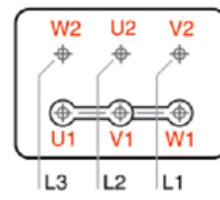


**3 PHASE / 2 SPEEDS / 2 SEPARATE WINDINGS**

*Lower Speed*



*High Speed*

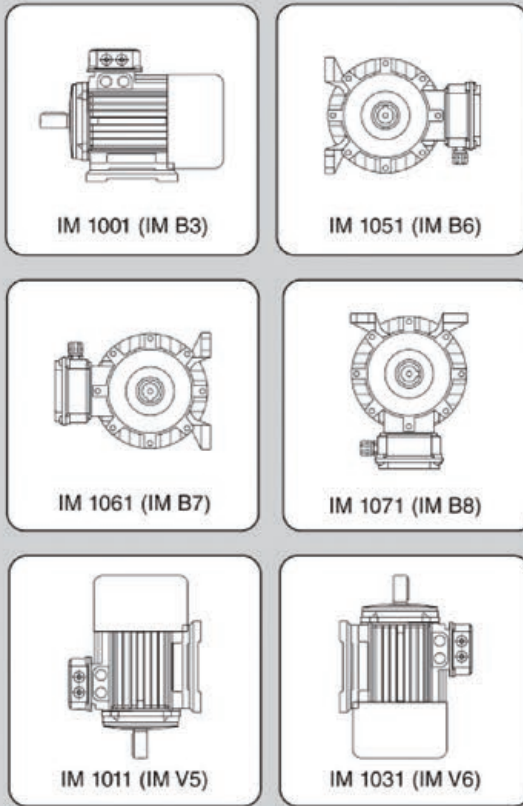


**6. MECHANICAL CHARACTERISTICS**

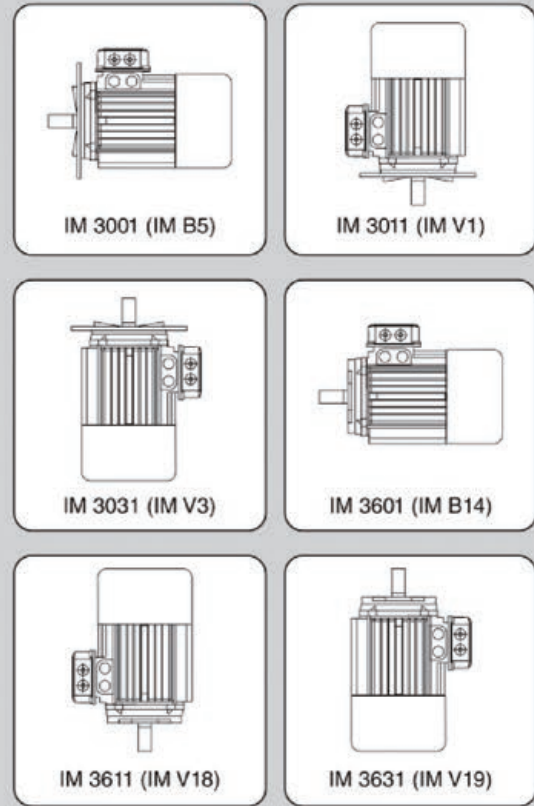


**Mounting Arrangements**

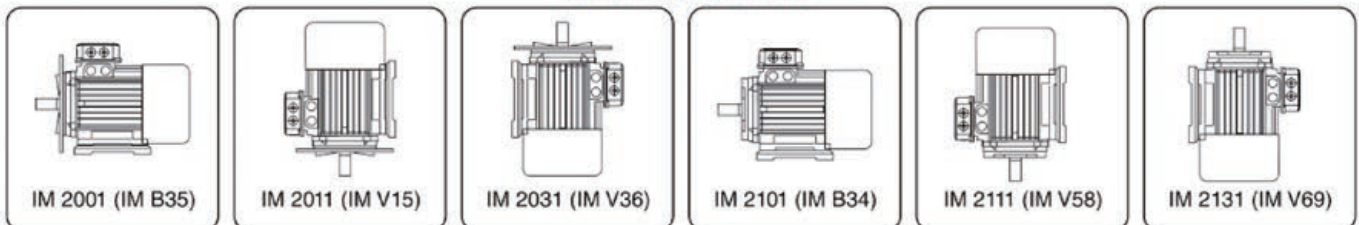
**Foot Mounted**



**Flange Mounted**



**Foot-flange Mounted**



In the table here below we show the main components of the motors and the material they are made of.

**Main Components**

Component	Material	Note
Frame	Cast Iron / Aluminium	Removable feet (Aluminium)
End-Shields	Cast Iron / Aluminium	
Flange B5	Cast Iron / Aluminium	
Flange B14	Cast Iron / Aluminium	
Terminal box	Cast Iron / Aluminium	
Shaft	Steel C40	
Rotor	Magnetic Lamination die-cast Aluminium	
Stator	Magnetic Lamination	
Windings	Enamelled Copper Wires (2 layers)	
V-Ring	NBR Rubber	Special Material: VITON
Bearings	Deep Groove Ball Bearings	See below
Fan	Plastic (Ex D, Ex de), Aluminium or antistatic plastic (Ex tb)	

## 7. SPARE PARTS, OVERHAULS & REPAIRS



### 7.1 Personnel qualification

Overhauls and repairs must be carried out only by qualified people in accordance with the standard EN 60079-17 or national standards (last edition). Qualified people must have knowledge about explosion protection.

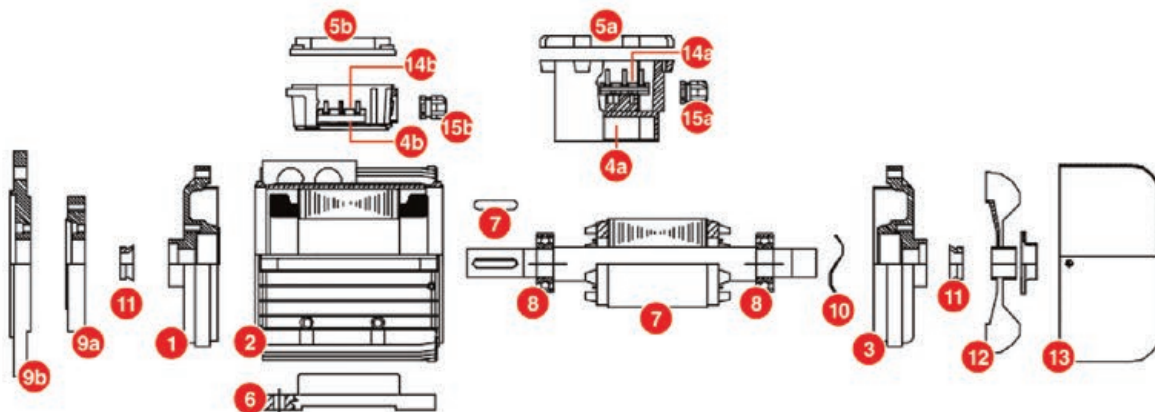
These repairs can only be done under the control or in agreement with ELPROM or by an ATEX certified workshop.

*Repairs must be made regarding the rules as define in EN 60079-19 standard.*

In case these rules are not complied, the product will not be covered by ELPROM ATEX certification anymore.

### 7.2 Spare parts

All motors components must be replaced with original spare parts. Please contact ELPROM directly & provide the serial number of the motor in order to be authorized for the repairs.



#### List of Main Spare Parts

- |                               |                                   |                                    |
|-------------------------------|-----------------------------------|------------------------------------|
| 1 Drive End shield            | 6 Feet (removable)                | 12 Fan (complete of fixing collar) |
| 2 Frame complete with winding | 7 Shaft complete of rotor and key | 13 Fan cover                       |
| 3 Non Drive End shield        | 8 Bearings                        | 14a Ex d Terminal board            |
| 4a Ex d Terminal box          | 9a B14 flange (removable)         | 14b Ex e Terminal board            |
| 4b Ex e Terminal box          | 9b B5 flange (removable)          | 15a Ex d cable gland (metallic)    |
| 5a Ex d Terminal box cover    | 10 Wave spring                    | 15b Ex e cable gland (plastic)     |
| 5b Ex e Terminal box cover    | 11 Shaft seals (V-ring)           |                                    |

## 8 ELECTRICAL DATA

Here below we give some information about all the types of motors.

### Three Phase 1 Speed

- Asynchronous motor, squirrel cage rotor, self ventilated (IC411).
- Duty S1, Insulation class "F", 230/400V - 50 Hz.

### Three Phase 2 Speeds

- Asynchronous motor, squirrel cage rotor, self ventilated (IC411).
- Duty S1, Insulation class "F", 400V - 50 Hz

### In case of motors driven by INVERTER:

- Motor must be equipped with PTC thermistor.
- Motor driven by frequency converter means not to have a voltage & current not perfectly sinusoidal with consequently increase of losses and heating of the motor.
- Speed variation affects also the ventilation.
- The stress on the bearings increases and they shall be checked more frequently; for this reason the operating period with a speed above 3600 rpm shall never exceed 10% of the complete working cycle.

Poles	Connections	CONSTANT TORQUE (General Purpose)		QUADRATIC TORQUE (Centrifugal Machines)	
		High Speed	Low Speed	High Speed	Low Speed
2/4 4/8	Dahlander	YY	Δ	YY	Y
4/6 6/8	2 Separate windings	Y	Y	Y	Y

**9. CAST IRON SERIES MOTORS**



**Ex d / Ex de - Explosion Proof Motors**  
**Cast Iron Frame**

**Motor Features:**

Three-phase, multi voltage, IP55, TEFC  
 Output : 0.37 up to 315kW  
 Voltage : 220 ~240/380-415V  
 : 380~415/660V  
 Continuous duty : S1  
 Performance : According to IEC 34  
 Degree of Protection : IP56, IP65 or IP66

**Suitable for applications:**

- Pumps, Fans, Crushers
- Conveyor belts
- Mills
- Centrifugal machines
- Presses
- Elevators
- Packaging equipment
- Grinders and etc...



ELPROM  
 Explosion Proof  
 Cast Iron Motor  
 (Ex d-IP55-IP66)

Frame Size	Sample of Constructions & Mounting Arrangements (IM)
80 ~ 112	B3, B5, B6, B7, B8, B14, B34, B35, V1, V3, V5, V6, V15, V18, V35, V37
132 ~ 160	B3, B5, B6, B7, B8, B35, V1, V3, V5, V6, V15, V35, V37
180 ~ 280	B3, B5, B35, V1
315 ~ 355	B3, B35, V1

**9.2 Bearing Type**

The bearing type of shaft height H80 ~ H355:

Motor Type	Frame	Pole	Drive-End	Non Drive-End	Motor Type	Frame	Pole	Drive-End	Non Drive-End
IE1/E2/IE3-80	80	2P ~ 8P	6204 2RZC3	6204 2RZC3	IE1/E2/IE3-225	225	2P ~ 8P	6313 C3	6313 C3
IE1/E2/IE3-90	90	2P ~ 8P	6205 2RZC3	6205 2RZC3	IE1/E2/IE3-250	250	2P ~ 8P	6314 C3	6314 C3
IE1/E2/IE3-100	100	2P ~ 8P	6206 2RZC3	6206 2RZC3	IE1/E2/IE3-280	280	2P	6314 C3	6314 C3
IE1/E2/IE3-112	112	2P ~ 8P	6206 2RZC3	6206 2RZC3	IE1/E2/IE3-280	280	4P ~ 8P	6317 C3	6317 C3
IE1/E2/IE3-132	132	2P ~ 8P	6308 2RZC3	6308 2RZC3	IE1/E2/IE3-315	315	2P	6317 C3	6317 C3
IE1/E2/IE3-160	160	2P ~ 8P	6309 C3	6309 C3	IE1/E2/IE3-315	315	4P ~ 8P	6319 C3	6319 C3
IE1/E2/IE3-180	180	2P ~ 8P	6311 C3	6311 C3	IE1/E2/IE3-355	355	2P	6319 C3	6319 C3
IE1/E2/IE3-200	200	2P ~ 8P	6312 C3	6312 C3	IE1/E2/IE3-355	355	4P ~ 8P	6322 C3	6322 C3

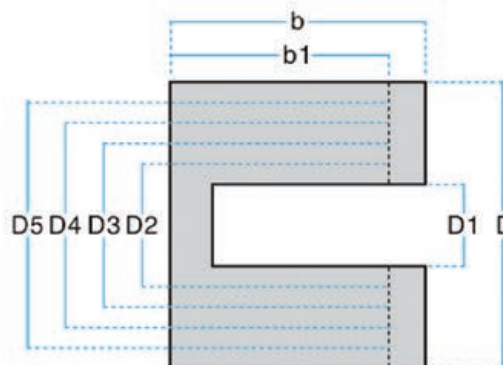
**10. DIAGRAM OF SEAL RING**

**10.1 Dimension of Sealing Ring**

(external diameter of entry cable for uses)

The diameter of the cable led into the terminal box should be in accordance with that of the hole of seal ring. Seal ring for cabtyre cable & armor cabtyre cable have many concentric grooves & the inner diameter of the seal ring can be selected according to the diameter of the cable, it should be ensure that there is no clearance between the seal ring & the cable, the seal ring & the base of the terminal box after the cable gland is pressed.

Schematic diagram of seal ring



\*\* Cables should be selected correctly according to rated current & operation condition of the motor.

Type	Cable Entry	D	D1	D2	D3	D4	D5	b	b1
EB3 80 ~ 112	Cabtyre Cable	Φ42° 0.062	Φ14	Φ20	Φ25	---	---	25	24
EB3 132 ~ 180		Φ58° 0.74	Φ14	Φ20	Φ26	Φ31	Φ35	26	24
EB3 200 ~ 225		Φ72° 0.74	Φ20	Φ26	Φ32	Φ38	Φ42	32	30
EB3 250 ~ 280		Φ90° 0.87	Φ25	Φ31	Φ36	Φ45	Φ50	38	36
EB3 315 ~ 355		Φ105° 0.5	Φ40	Φ46	Φ51	Φ57	Φ64	45	42

## 11. ELECTRICAL DATA (IP55) Cast Iron (EB3 Series)



### 3000 (2P) Voltage: 400V 50Hz

Type	Power (kW)	Speed (rpm)	Full load / Current A			Locked Rotor Current (Current Rated)	Eff. (%)	Power Factor (Cosφ)	Rated Torque (Nm)	Locked Rotor Torque	Breakdown Torque rated	Moment of Inertia (kgm <sup>2</sup> )	Noise LP dB (A)	Net Weight (kg)		
			V380	V400	V415											
EB3-80M1-2	0.75	2850	1.8	1.7	1.7	7.0	75.5	0.83	2.4			0.0010	57	28		
EB3-80M2-2	1.1	2852	2.5	2.4	2.4		79.6	0.84	3.5			0.0013	58	31		
EB3-90S-2	1.5	2866	3.3	3.2	3.1		81.3	0.84	4.8			0.0020	61	36		
EB3-90L-2	2.2	2868	4.6	4.5	4.4	7.5	83.2	0.85	7	2.3		0.0026	61	40		
EB3-100L-2	3	2892	6.1	5.9	5.8		84.6	0.87	9.5			0.0036	65	50		
EB3-112M-2	4	2941	7.9	7.6	7.5		85.8	0.88	12.7			0.0068	67	66		
EB3-132S1-2	5.5	2922	10.7	10.4	10.2	7.5	87.0	0.88	17.5	2.0	2.4	0.0126	70	82		
EB3-132S2-2	7.5	2925	14.3	13.8	13.6		88.1	0.88	23.9			0.0145	70	87		
EB3-160M1-2	11	2952	20.5	20.0	19.7		89.4	0.88	35			0.048	72	149		
EB3-160M2-2	15	2954	27.27	26.9	26.6	7.5	90.3	0.89	47.7	2.3		0.0569	72	159		
EB3-160L-2	18.5	2955	34.0	33.0	32.5		90.9	0.89	58.9			0.064	72	172		
EB3-180M-2	22	2964	40.2	39.1	38.5		91.3	0.9	70			0.0982	75	232		
EB3-200L1-2	30	2969	54.4	52.9	52.1	7.4	92.0	0.9	95.5	1.8	2.4	0.161	81	289		
EB3-200L2-2	37	2969	66.8	64.9	64.0		92.5	0.9	117.8			0.191	81	307		
EB3-225M-2	45	2974	80.9	78.6	77.5		92.9	0.9	143.2			0.271	81	351		
EB3-250M-2	55	2974	98.5	95.7	94.4	7.4	93.2	0.9	175.1	2.3		0.338	84	510		
EB3-280S-2	75	2977	133.8	129.7	127.9		93.8	0.9	238.7			0.647	85	639		
EB3-280M-2	90	2978	159.7	155.1	152.9		94.1	0.91	286.5			0.765	85	695		
EB3-315S-2	110	2982	192.6	187.1	184.4	7.4	94.3	0.91	350.1	1.6	2.2	1.358	88	1075		
EB3-315M-2	132	2984	230.4	223.8	220.6		94.6	0.91	420.2			1.499	88	1182		
EB3-315L1-2	160	2987	275.7	267.7	263.8		94.8	0.91	509.3			1.697	88	1280		
EB3-315L2-2	200	2988	343.9	333.9	329.1	7.4	95.0	0.91	636.6	1.8		1.923	88	1440		
EB3-355S1-2 (185)	2988	318.1	308.9	304.4	7.4		95.0	0.91	588.9			2.2		2.317	88	1680
EB3-355S2-2 (200)	2988	343.9	333.9	329.1			95.0	0.92	636.6					2.317	88	1740
EB3-355M1-2 (220)	2989	378.3	367.3	362.0		95.0	0.92	700.3	2.670	88	1790					
EB3-355M2-2	250	2990	429.9	417.4	411.4	7.4	95.0	0.92	795.8	1.6		2.670	89	1840		
EB3-355L1-2 (280)	2990	481.5	467.5	460.8	95.0		0.92	891	3.141			89	2040			
EB3-355L2-2	315	2991	541.7	525.9	518.3		95.0	0.92	1003			3.770	89	2060		

\* Note: The value with ( ) is not recommended.

### 3600 (2P) Voltage: 460V 60Hz

Type	Power (kW)	Speed (rpm)	Full load / Current A			Locked Rotor Current (Current Rated)	Eff. (%)	Power Factor (Cosφ)	Rated Torque (Nm)	Locked Rotor Torque	Breakdown Torque rated	Moment of Inertia (kgm <sup>2</sup> )	Noise LP dB (A)	Net Weight (kg)		
			V440	V460	V480											
EB3-80M1-2	0.75	3458	1.8	1.7	1.7	7.0	77.4	0.88	2.4			0.0010	60	28		
EB3-80M2-2	1.1	3458	2.4	2.3	2.3		82.5	0.88	3.5			0.0013	61	31		
EB3-90S-2	1.5	3458	3.1	3.1	3.0		84.0	0.87	4.8			0.0020	64	36		
EB3-90L-2	2.2	3464	4.4	4.3	4.3	7.5	85.5	0.86	7	2.3		0.0026	64	40		
EB3-100L-2	3	3470	5.8	5.7	5.5		87.5	0.89	9.5			0.0036	68	50		
EB3-112M-2	4	3470	7.6	7.5	7.3		87.5	0.91	12.7			0.0068	70	66		
EB3-132S1-2	5.5	3500	10.3	10.1	9.9	7.5	88.6	0.90	17.5	2.0	2.4	0.0126	73	82		
EB3-132S2-2	7.5	3494	13.8	13.5	13.2		89.5	0.91	23.9			0.0145	73	87		
EB3-160M1-2	11	3530	20.2	19.7	19.4		90.5	0.91	35			0.048	75	149		
EB3-160M2-2	15	3530	27.5	26.9	26.4	7.5	90.3	0.91	47.7	2.3		0.0569	75	159		
EB3-160L-2	18.5	3524	33.6	32.8	32.2		91.0	0.91	58.9			0.064	75	172		
EB3-180M-2	22	3548	39.39	39.0	38.2		91.0	0.90	70			0.0982	78	232		
EB3-200L1-2	30	3554	54.0	52.8	51.7	7.4	92.0	0.91	95.5	1.8	2.4	0.161	84	289		
EB3-200L2-2	37	3554	66.1	64.7	63.4		93.3	0.91	117.8			0.191	84	307		
EB3-225M-2	45	3554	79.9	78.1	76.6		93.7	0.90	143.2			0.271	84	351		
EB3-250M-2	55	3554	97.6	95.5	93.6	7.4	94.0	0.91	175.1	2.3		0.338	87	570		
EB3-280S-2	75	3572	132.2	129.3	126.7		94.6	0.91	238.7			0.647	88	639		
EB3-280M-2	90	3560	157.1	153.6	150.6		95	0.91	286.5			0.765	88	695		
EB3-315S-2	110	3572	189.9	185.7	181.9	7.4	95	0.92	350.1	1.6	2.2	1.358	91	1075		
EB3-315M-2	132	3752	226.7	221.6	217.2		95.4	0.92	420.2			1.499	91	1182		
EB3-315L1-2	160	3572	271.8	265.7	260.3		95.4	0.93	509.3			1.697	91	1280		
EB3-315L2-2	200	3572	338.4	330.7	324.0	7.4	95.4	0.93	636.6	1.8		1.923	91	1440		
EB3-355S1-2 (185)	3572	313.0	305.9	299.7	7.4		95.4	0.93	588.9			2.2		2.317	91	1680
EB3-355S2-2 (200)	3572	338.4	330.7	324.0			95.4	0.93	636.6					2.317	91	1740
EB3-355M1-2 (220)	3572	372.2	363.8	356.4		95.5	0.93	700.3	2.670	91	1790					
EB3-355M2-2	250	3578	422.9	413.4	405.0	7.4	95.5	0.915	795.8	1.6		2.670	92	1840		
EB3-355L1-2 (280)	3578	473.6	463.0	453.6	95.8		0.915	891	3.141			92	2040			
EB3-355L2-2	315	3578	533.0	520.9	570.4		95.8	0.915	1003			3.770	92	2060		

\* Note: The value with ( ) is not recommended.



## 11. ELECTRICAL DATA (IP55) Cast Iron (EB3 Series)



**1000 (6P)** Voltage: 400V 50Hz

Type	Power (kW)	Speed (rpm)	Full load / Current A			Locked Rotor Current (Current Rated)	Eff. (%)	Power Factor (Cosφ)	Rated Torque (Nm)	Locked Rotor Torque	Breakdown Torque rated	Moment of Inertia (kgm <sup>2</sup> )	Noise LP dB (A)	Net Weight (kg)
			V380	V400	V415									
EB3-80M1-6	0.37	926	1.3	1.2	1.2	6.5	63.0	0.70	3.5	1.9		0.0021	61	27.6
EB3-80M2-6	0.55	928	1.6	1.5	1.5		74.0	0.72	5.3			0.0031	61	30
EB3-90S-6	0.75	933	2.1	2.0	2.0	6.8	77.7	0.72	7.2	2.1		0.0043	56	35
EB3-90L-6	1.1	933	2.9	2.8	2.8		79.9	0.73	10.5			0.0058	56	40
EB3-100L-6	1.5	936	3.9	3.8	3.7	7	81.5	0.75	14.3			0.0109	60	48
EB3-112M-6	2.2	959	5.5	5.4	5.3		83.4	0.76	21.0			0.015	64	62
EB3-132S-6	3	974	7.4	7.2	7.2	7	84.9	0.76	28.6	2.4		0.0341	68	87
EB3-132M1-6	4	974	9.5	9.2	9.1		86.1	0.76	38.2			0.041	68	95
EB3-132M2-6	5.5	974	12.6	12.3	12.2	7.2	87.4	0.77	52.5			0.0529	68	103
EB3-160M-6	7.5	978	16.3	15.9	15.7		89.0	0.77	71.6			0.105	72	147
EB3-160L-6	11	979	23.3	22.7	22.4	2.0	90.0	0.78	105.0	2.1		0.138	72	175
EB3-180L-6	15	983	30.2	29.4	29.1		91.0	0.81	143.2			0.22	71	230
EB3-200L1-6	18.5	985	37.9	36.9	36.5	7.2	91.5	0.81	176.7			0.349	74	279
EB3-200L2-6	22	985	44.3	43.1	42.6		92.0	0.83	210.1			0.399	74	284
EB3-225M-6	30	987	59.2	57.6	56.9	2.0	92.5	0.86	286.5	2.4		0.653	74	356
EB3-250M-6	37	988	71.7	69.8	68.9		93.0	0.86	353.3			0.941	72	465
EB3-280S-6	45	991	84.8	82.4	81.4	2.2	93.5	0.86	429.7			1.63	73	589
EB3-280M-6	55	992	102.0	99.2	97.8		93.8	0.86	525.2			1.868	73	655
EB3-315S-6	75	993	141.4	137.5	135.8	7.2	94.2	0.86	716.2			3.657	77.5	1074
EB3-315M-6	90	993	167.2	162.6	160.5		94.5	0.86	859.4			4.149	77.5	1170
EB3-315L1-6	110	994	203.7	198.1	195.5	2.0	94.5	0.87	1050	2.1		5.063	77.5	1295
EB3-315L2-6	132	994	240.9	234.2	231.1		94.5	0.87	1260			5.977	76.5	1450
EB3-355S-6	160	994	291.4	283.3	279.5	7.2	94.5	0.87	1528	2.0		11.64	83	1770
EB3-355M1-6	(185)	994	336.9	327.6	323.2		95.0	0.88	1767			12.513	83	1820
EB3-355M2-6	200	995	363.5	353.3	348.7	1.9	95.0	0.88	1910			13.386	83	1850
EB3-355L1-6	(220)	995	400	388.6	383.6		95.0	0.88	2101			15.132	83	2070
EB3-355L2-6	250	995	454.4	441.7	435.9	95.0	0.88	2387	16.878	83	2130			

\* Note: The value with ( ) is not recommended.

**1170 (6P)** Voltage: 460V 60Hz

Type	Power (kW)	Speed (rpm)	Full load / Current A			Locked Rotor Current (Current Rated)	Eff. (%)	Power Factor (Cosφ)	Rated Torque (Nm)	Locked Rotor Torque	Breakdown Torque rated	Moment of Inertia (kgm <sup>2</sup> )	Noise LP dB (A)	Net Weight (kg)
			V380	V400	V415									
EB3-80M1-6	0.37	1125	1.2	1.2	1.2	6.5	63.0	0.70	3.5	1.9		0.0021	61	27.6
EB3-80M2-6	0.55	1128	1.5	1.4	1.4		75.4	0.72	5.3			0.0031	61	30
EB3-90S-6	0.75	1136	1.9	1.9	1.9	6.8	77.7	0.72	7.2	2.1		0.0043	56	35
EB3-90L-6	1.1	1136	2.6	2.6	2.5		79.9	0.73	10.5			0.0058	56	40
EB3-100L-6	1.5	1142	3.5	3.5	3.4	7	81.5	0.75	14.3			0.0109	60	48
EB3-112M-6	2.2	1118	5.1	5.0	4.9		83.4	0.76	21.0			0.015	64	62
EB3-132S-6	3	1166	6.9	6.8	6.7	7	84.9	0.76	28.6	2.4		0.0341	68	87
EB3-132M1-6	4	1166	9.0	8.9	8.7		86.1	0.76	38.2			0.041	68	95
EB3-132M2-6	5.5	1166	12.0	11.8	11.6	7.2	87.4	0.77	52.5			0.0529	68	103
EB3-160M-6	7.5	1172	15.7	15.4	15.2		89.0	0.77	71.6			0.105	72	147
EB3-160L-6	11	1172	22.7	22.2	21.9	2.0	90.0	0.78	105.0	2.1		0.138	72	175
EB3-180L-6	15	1172	29.8	29.2	28.7		91.0	0.81	143.2			0.22	71	230
EB3-200L1-6	18.5	1178	36.9	36.2	35.6	7.2	91.5	0.81	176.7			0.349	74	279
EB3-200L2-6	22	1178	43.4	42.5	41.7		92.0	0.83	210.1			0.399	74	284
EB3-225M-6	30	1172	57.6	56.2	55.4	2.0	92.5	0.84	286.5	2.4		0.653	74	356
EB3-250M-6	37	1184	70.3	68.9	67.6		93.0	0.86	353.3			0.941	72	465
EB3-280S-6	45	1184	83.3	81.2	79.7	2.2	93.5	0.86	429.7			1.63	73	589
EB3-280M-6	55	1184	100.3	98.1	96.3		93.8	0.86	525.2			1.868	73	655
EB3-315S-6	75	1190	139.1	136.2	133.7	7.2	94.2	0.86	716.2			3.657	77.5	1074
EB3-315M-6	90	1190	164.9	161.5	158.4		94.5	0.86	859.4			4.149	77.5	1170
EB3-315L1-6	110	1190	199.7	195.5	191.8	2.0	95.0	0.86	1050	2.1		5.063	77.5	1295
EB3-315L2-6	132	1190	236.9	231.9	227.5		95.0	0.87	1260			5.977	76.5	1450
EB3-355S-6	160	1190	287.2	281.0	275.7	7.2	95.0	0.88	1528	2.0		11.64	83	1770
EB3-355M1-6	(185)	1190	332.1	324.9	318.8		95.0	0.88	1767			12.513	83	1820
EB3-355M2-6	200	1190	359.0	351.3	344.6	1.9	95.0	0.88	1910			13.386	83	1850
EB3-355L1-6	(220)	1190	394.9	386.4	379.1		95.0	0.88	2101			15.132	83	2070
EB3-355L2-6	250	1190	448.7	439.1	430.8	95.0	0.88	2387	16.878	83	2130			

\* Note: The value with ( ) is not recommended.



## 11. ELECTRICAL DATA (IP55) Cast Iron (EB3 Series)



### 750 (8P) Voltage: 400V 50Hz

Type	Power (kW)	Speed (rpm)	Full load / Current A			Locked Rotor Current (Current Rated)	Eff. (%)	Power Factor (Cosφ)	Rated Torque (Nm)	Locked Rotor Torque	Breakdown Torque rated	Moment of Inertia (kgm <sup>2</sup> )	Noise LP dB (A)	Net Weight (kg)	
			V380	V400	V415										
EB3-80M1-8	0.18	650	0.86	0.82	0.76	3.3	52	0.61	2.6	1.8	2.0	0.0027	60	29	
EB3-80M2-8	0.25	650	1.14	1.08	1.04		55	0.61	3.7			1.9	0.0032	60	30
EB3-90S-8	0.37	670	1.44	1.37	1.32		63	0.62	5.3			0.0043	56	37	
EB3-90L-8	0.55	670	2.07	1.97	1.90	4	64	0.63	7.8	0.0055	56	40			
EB3-100L1-8	0.75	690	2.36	2.24	2.16		71	0.68	10.4	0.0067	59	45			
EB3-100L2-8	1.1	690	3.32	3.15	3.04		73	0.69	15.2	0.0093	59	49			
EB3-112M-8	1.5	690	4.4	4.2	4.0	5.5	75	0.69	20.8	0.0143	61	65			
EB3-132S-8	2.2	710	5.8	5.5	5.3		79	0.73	30	0.032	65	83			
EB3-132M-8	3	710	7.7	7.3	7.0		81	0.73	40.4	0.055	65	94			
EB3-160M1-8	4	720	10.3	9.8	9.4	6	81	0.73	53.1	0.067	68	132			
EB3-160M2-8	5.5	720	13.4	12.8	12.3		83	0.75	73	0.097	68	144			
EB3-160L-8	7.5	730	17.7	16.8	16.2		85	0.76	98.1	0.134	68	166			
EB3-180L-8	11	730	25.3	24.4	23.1	6.5	87	0.76	143.9	0.258	70	223			
EB3-200L-8	15	730	33.7	32.0	30.8		89	0.76	196.2	0.410	72	279			
EB3-225S-8	18.5	740	40.0	38.0	36.6		90	0.78	238.8	0.620	72	332			
EB3-225M-8	22	740	47.4	45.0	43.4	6	90.5	0.78	283.9	0.670	72	363			
EB3-250M-8	30	740	63.4	60.2	58.0		91	0.79	387.2	1.120	72	478			
EB3-280S-8	37	740	77.8	73.9	71.2		91.5	0.79	477.5	1.300	73	585			
EB3-280M-8	45	740	94.1	84.4	81.1	6.5	92	0.79	580.7	1.600	72	648			
EB3-315S-8	55	740	111.2	105.6	101.8		92.8	0.81	709.8	4.850	76	972			
EB3-315M-8	75	740	150.4	142.9	137.7		93.5	0.81	967.9	6.000	76	1080			
EB3-315L1-8	90	740	177.8	168.9	162.8	1.8	93.8	0.82	1161.5	6.900	76	1226			
EB3-315L2-8	110	740	216.8	206.0	198.6		94	0.82	1420	7.800	76	1310			
EB3-355S-8	132	740	260.0	246.7	237.8		94.2	0.82	1703.5	11.800	83	1405			
EB3-355M-8	160	742	314.7	299.0	288.2	6.5	94.2	0.82	2059.3	11.800	83	1880			
EB3-355L1-8	185	742	363.9	345.7	333.2		94.2	0.82	2381.1	14.800	83	1978			
EB3-355L2-8	200	742	387.4	368.0	354.7		94.25	0.83	2574.1	17.400	83	2130			

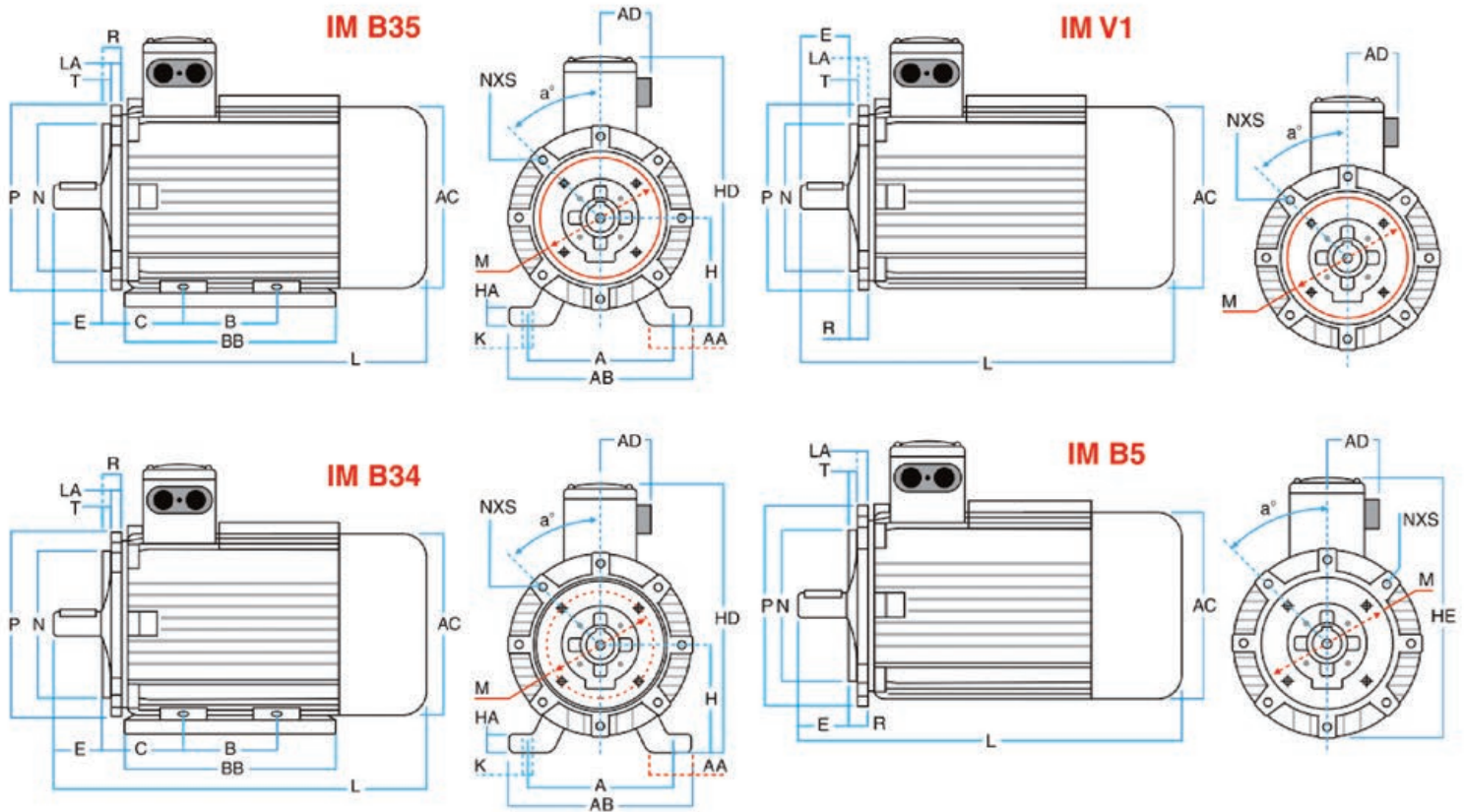
\* Note: The value with ( ) is not recommended.

### 850 (8P) Voltage: 460V 60Hz

Type	Power (kW)	Speed (rpm)	Full load / Current A			Locked Rotor Current (Current Rated)	Eff. (%)	Power Factor (Cosφ)	Rated Torque (Nm)	Locked Rotor Torque	Breakdown Torque rated	Moment of Inertia (kgm <sup>2</sup> )	Noise LP dB (A)	Net Weight (kg)	
			V340	V460	V480										
EB3-80M1-8	0.18	775	0.87	0.83	0.80	3.3	52	0.61	2.6	1.8	2.0	0.0027	60	29	
EB3-80M2-8	0.25	775	1.13	1.08	1.04		55	0.61	3.7			1.9	0.0032	60	30
EB3-90S-8	0.37	805	1.44	1.38	1.32		63	0.62	5.3			0.0043	56	37	
EB3-90L-8	0.55	805	2.05	1.96	1.88	4	64	0.63	7.8	0.0055	56	40			
EB3-100L1-8	0.75	815	2.34	2.24	2.15		71	0.68	10.4	0.0067	59	45			
EB3-100L2-8	1.1	815	3.31	3.17	3.03		73	0.69	15.2	0.0093	59	49			
EB3-112M-8	1.5	815	4.4	4.2	4.0	5.5	75	0.69	20.8	0.0143	61	65			
EB3-132S-8	2.2	845	5.8	5.5	5.3		79	0.73	30	0.032	65	83			
EB3-132M-8	3	845	7.7	7.4	7.1		81	0.73	40.4	0.055	65	94			
EB3-160M1-8	4	865	10.2	9.8	9.4	6	81	0.73	53.1	0.067	68	132			
EB3-160M2-8	5.5	865	13.3	12.7	12.2		83	0.75	73	0.094	68	144			
EB3-160L-8	7.5	875	17.5	16.8	16.1		85	0.76	98.1	0.134	68	166			
EB3-180L-8	11	875	25.2	24.1	23.1	6.5	87	0.76	143.9	0.258	70	223			
EB3-200L-8	15	875	33.5	32.0	30.7		89	0.76	196.2	0.410	72	279			
EB3-225S-8	18.5	880	39.8	38.1	36.5		90	0.78	238.8	0.620	72	332			
EB3-225M-8	22	880	47.0	45.0	43.1	6	90.5	0.78	283.9	0.670	72	363			
EB3-250M-8	30	880	63.0	60.2	57.8		91	0.79	387.2	1.120	72	478			
EB3-280S-8	37	880	77.3	73.9	70.9		91.5	0.79	477.5	1.300	73	585			
EB3-280M-8	45	880	93.5	89.5	85.7	6.5	92	0.79	580.7	1.600	72	648			
EB3-315S-8	55	880	110.5	105.7	101.3		92.8	0.81	709.8	4.850	76	972			
EB3-315M-8	75	880	149.5	143.0	137.0		93.5	0.81	967.9	6.000	76	1080			
EB3-315L1-8	90	880	176.6	168.9	161.9	1.8	93.8	0.82	1161.5	6.900	76	1226			
EB3-315L2-8	110	880	215.3	206.0	197.4		94	0.82	1420	7.800	76	1310			
EB3-355S-8	132	880	257.9	246.7	236.4		94.2	0.82	1703.5	11.800	83	1405			
EB3-355M-8	160	890	312.6	299.0	286.6	6.5	94.2	0.82	2059.3	11.800	83	1880			
EB3-355L1-8	185	890	361.5	345.8	331.4		94.2	0.82	2381.1	14.800	83	1978			
EB3-355L2-8	200	890	384.8	368.0	352.7		94.5	0.83	2574.1	17.400	83	2130			

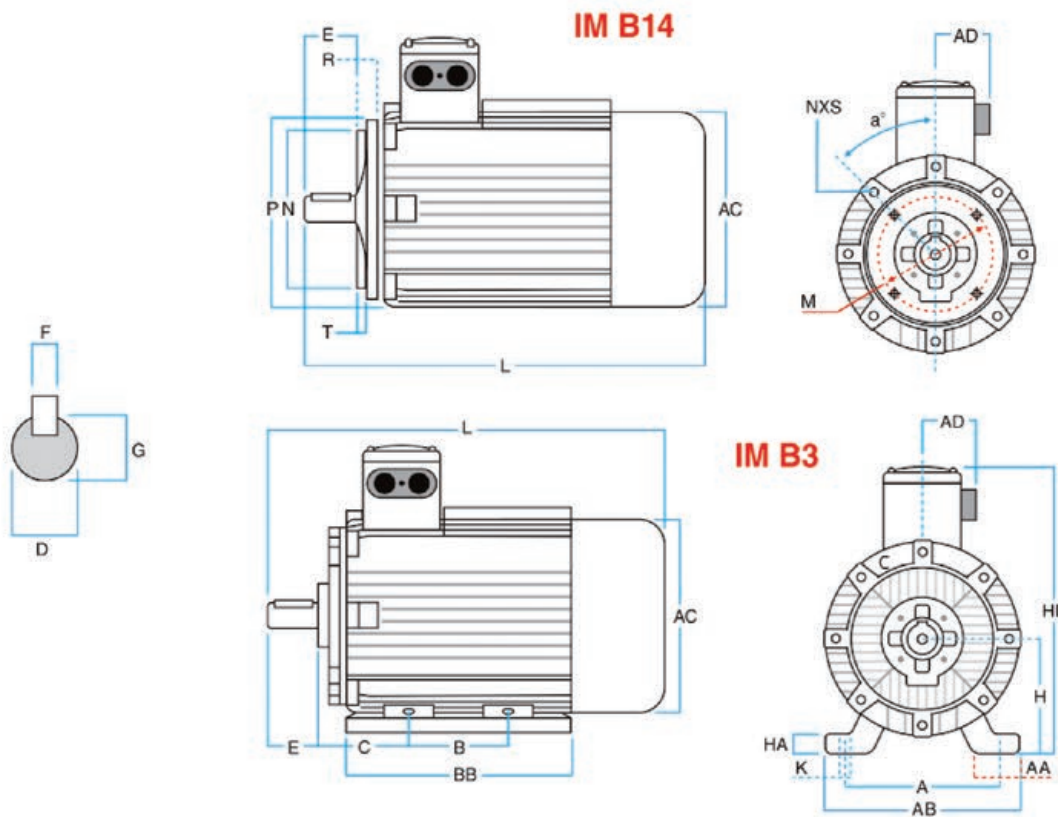
\* Note: The value with ( ) is not recommended.

## 12. EB3 SERIES FLAMEPROOF 3 PHASE INDUCTION MOTORS (IP55) Cast Iron (Square box)



Model/ Frame Size	Flange		A	B	C	D		E		F		G		H	K	Flange Dimensions: IMB35 /					
	IM B35, B5, V1	IM B14, B34				2P	4P	2P	4P	2P	4P	2P	4P			M	N	P	R	a°	NXS
EM3 80	FF165	FF100	125	100	50	19	40	6	15.5	80	10	165	130	200	0	45	4xF12				
EM3 90S	FF165	FF115	140	100	56	24	50	8	20	90	10	165	130	200	0	45	4xF12				
EM3 90L	FF165	FF115	140	125	56	24	50	8	20	90	10	165	130	200	0	45	4xF12				
EM3 100L	FF215	FF130	160	140	63	28	60	8	24	100	12	215	180	250	0	45	4xF14.5				
EM3 112M	FF215	FF130	190	140	70	28	60	8	24	112	12	215	180	250	0	45	4xF14.5				
EM3 132S	FF265		216	140	89	38	80	10	33	132	12	265	230	300	0	45	4xF14.5				
EM3 132M	FF265		216	178	89	38	80	10	33	132	12	265	230	300	0	45	4xF14.5				
EM3 160M	FF300		254	210	108	42	110	12	37	160	14.5	300	250	350	0	45	4xF18.5				
EM3 160L	FF300		254	254	108	42	110	12	37	160	14.5	300	250	350	0	45	4xF18.5				
EM3 180M	FF300		279	241	121	48	110	14	42.5	180	14.5	300	250	350	0	45	4xF18.5				
EM3 180L	FF300		279	279	121	48	110	14	42.5	180	14.5	300	250	350	0	45	4xF18.5				
EM3 200L	FF350		318	305	133	55	110	16	49	200	18.5	350	300	400	0	45	4xF18.5				
EM3 225S	FF400		356	286	149	55	60	110	140	16	18	49	53	225	18.5	400	350	450	0	22.5	4xF18.5
EM3 225M	FF400		356	311	149	55	60	110	140	16	18	49	53	225	18.5	400	350	450	0	22.5	4xF18.5
EM3 250M	FF500		406	349	168	60	65	140	140	18	18	53	58	250	24	500	450	550	0	22.5	4xF18.5
EM3 280S	FF500		457	368	190	65	75	140	140	18	20	58	67.5	280	24	500	450	550	0	22.5	4xF18.5
EM3 280M	FF500		457	419	190	65	75	140	140	18	20	58	67.5	280	24	500	450	550	0	22.5	4xF18.5
EM3 315S	FF600		508	406	216	65	80	140	170	18	22	58	71	315	28	600	550	660	0	22.5	8x24
EM3 315M	FF600		508	457	216	65	80	140	170	18	22	58	71	315	28	600	550	660	0	22.5	8x24
EM3 315L	FF600		508	508	216	65	80	140	170	18	22	58	71	315	28	600	550	660	0	22.5	8x24
EM3 355S	FF740		610	500	254	75	95	140	170	20	25	67.5	86	355	28	740	680	800	0	22.5	8x24
EM3 355M	FF740		610	560	254	75	95	140	170	20	25	67.5	86	355	28	740	680	800	0	22.5	8x24
EM3 355L	FF740		610	630	254	75	95	140	170	20	25	67.5	86	355	28	740	680	800	0	22.5	8x24

## 12. EB3 SERIES FLAMEPROOF 3 PHASE INDUCTION MOTORS (IP55) Cast Iron (Square box)



IMB5 / IMV1 / IMB14 / IM B34								Thread of conduit entry												L			
T	M	N	P	R	a°	NXS	T	1 Entry	2 Entry	AA	AB	AC	AD	BB	HA	HD	HE	LA	2P		4P		
																			other	V <sub>i</sub>	other	V <sub>i</sub>	
3.5	100	80	120	0	45	4XM6	3.0	M30X2		34	165	165	180	135	10	340	340	12	330	375	330	375	
3.5	115	95	140	0	45	4XM8	3.0	M30X2		36	180	180	180	135	14	355	355	14	370	415	370	415	
3.5	115	95	140	0	45	4XM8	3.0	M30X2		36	180	180	180	160	14	355	355	14	395	440	395	440	
4.0	130	110	160	0	45	4XM8	3.5	M30X2		43	200	205	180	180	14	360	400	14	448	485	448	485	
4.0	130	110	160	0	45	4XM8	3.5	M30X2		50	245	225	200	180	16	380	420	14	500	560	500	560	
4.0								M30X2		60	280	265	200	190	18	470	490	14	550	610	550	610	
4.0								M30X2		60	280	265	200	230	18	470	490	14	600	660	600	660	
5.0								M36X2		70	330	320	220	260	20	500	520	15	720	710	720	780	
5.0								M36X2		70	330	320	220	310	20	500	520	15	750	810	750	810	
5.0								M36X2		70	355	360	220	315	25	540	540	18	770	830	770	830	
5.0								M36X2		70	355	360	220	355	25	540	540	18	790	830	770	830	
5.0								M48X2		70	390	400	250	370	25	650	650	18	850	920	850	920	
5.0								M48X2		75	435	450	250	360	28	695	695	18	890	960	890	960	
5.0								M48X2		75	435	450	250	385	28	695	695	18	920	990	920	990	
5.0								M64X2	M48X2	80	490	500	275	430	30	730	755	20	965	1055	965	1055	
5.0								M64X2	M48X2	85	545	560	275	455	35	800	795	22	1010	1100	1010	1100	
5.0								M64X2	M48X2	85	545	560	275	505	35	800	795	22	1060	1150	1060	1150	
6.0								M64X2		120	635	630	350	630	45	960	975	25	1240	1340	1270	1370	
6.0								M64X2		120	635	630	350	630	45	960	975	25	1240	1340	1270	1370	
6.0								M64X2		120	635	630	350	780	45	960	975	25	1390	1490	1420	1520	
6.0								M72X2		150	735	710	350	710	52	1030	1145	25	1450	1590	1480	1620	
6.0								M72X2		150	735	710	350	710	52	1030	1145	25	1450	1590	1480	1620	
6.0								M72X2		150	735	710	350	810	52	1030	1145	25	1550	1690	1580	1720	

**13. ELECTRICAL DATA (IP66) Aluminium (OD Series)**



**3000 3 PHASE-1 SPEED** Voltage: 400V 50Hz

Type	Power (kW)	Speed (rpm)	Eff. (%)	Power Factor (Cosφ)	Full Load Amps I <sub>n</sub> (A)	Rated Torque (Nm)	Locked Rotor Current (I <sub>L</sub> /I <sub>n</sub> )	Locked Rotor Torque (M <sub>L</sub> /M <sub>n</sub> )	Breakdown Torque (M <sub>B</sub> /M <sub>n</sub> )	Moment of Inertia (kgm <sup>2</sup> )	Mass Weight (kg)
OD-56B2	0.12	2850	50%	0.76	0.5	0.43	4.8	3.6	3.8	0.00016	3.5
OD-63A2	0.18	2825	56%	0.76	0.62	0.61	3.9	2.6	3.6	0.00017	4
OD-63B2	0.25	2750	60%	0.83	0.74	0.87	3.3	1.8	2.5	0.00022	4
OD-71A2	0.37	2850	71%	0.78	1	1.24	4.5	2.4	2.7	0.00035	6
OD-71B2	0.55	2840	70%	0.78	1.45	1.85	4.9	3.3	3.4	0.00045	6.5
OD-80A2	0.75	2870	73%	0.72	2	2.5	5.3	3	4	0.00068	9
OD-80B2	1.1	2830	72%	0.86	2.6	2.7	4.1	2	2.7	0.00088	11
OD-90S2	1.5	2850	68%	0.83	3.95	5.1	4.2	2.4	2.6	0.00118	13
OD-90L2	2.2	2840	70%	0.85	5.4	7.2	5.1	3.7	3.9	0.00180	15
OD-100L2	3	2900	75%	0.8	7.3	10	5.4	2.2	3.8	0.00279	20
OD-112M2	4	2910	78%	0.83	9.2	13.2	8.2	2.4	2.8	0.00544	28

**1500 3 PHASE-1 SPEED** Voltage: 400V 50Hz

Type	Power (kW)	Speed (rpm)	Eff. (%)	Power Factor (Cosφ)	Full Load Amps I <sub>n</sub> (A)	Rated Torque (Nm)	Locked Rotor Current (I <sub>L</sub> /I <sub>n</sub> )	Locked Rotor Torque (M <sub>L</sub> /M <sub>n</sub> )	Breakdown Torque (M <sub>B</sub> /M <sub>n</sub> )	Moment of Inertia (kgm <sup>2</sup> )	Mass Weight (kg)
OD-56A4	0.09	1450	50%	0.63	0.46	0.63	2.4	2.7	3.1	0.00020	3.5
OD-63A4	0.12	1420	50%	0.53	0.71	0.8	2.7	3.3	3.9	0.00021	4
OD-63B4	0.18	1380	53%	0.65	0.76	1.25	2.6	2.1	2.5	0.00029	4
OD-71A4	0.25	1400	55%	0.81	0.84	1.7	3.8	2.4	2.8	0.00073	6.5
OD-71B4	0.37	1410	66%	0.68	1.2	2.52	3.9	2.5	2.9	0.00080	7
OD-80A4	0.55	1430	68%	0.71	1.75	3.75	4.3	2.7	3.2	0.00092	8
OD-80B4	0.75	1410	72%	0.75	2.1	5.1	3.9	2.3	2.4	0.00128	11
OD-90S4	1.1	1420	71%	0.7	3.3	7.5	3.7	2.8	3.2	0.00203	12
OD-90L4	1.5	1415	75%	0.78	3.8	10.16	4.2	2.2	3.1	0.00265	14
OD-100K4	2.2	1440	77%	0.77	5.8	14.5	4.9	2	2.3	0.00450	20
OD-100L2	3	1420	79%	0.81	6.8	20.3	4.4	1.9	2.7	0.00599	23
OD-112M4	4	1450	84%	0.76	9.1	26.4	4.8	2.2	3.5	0.01112	30

**1000 3 PHASE-1 SPEED** Voltage: 400V 50Hz

Type	Power (kW)	Speed (rpm)	Eff. (%)	Power Factor (Cosφ)	Full Load Amps I <sub>n</sub> (A)	Rated Torque (Nm)	Locked Rotor Current (I <sub>L</sub> /I <sub>n</sub> )	Locked Rotor Torque (M <sub>L</sub> /M <sub>n</sub> )	Breakdown Torque (M <sub>B</sub> /M <sub>n</sub> )	Moment of Inertia (kgm <sup>2</sup> )	Mass Weight (kg)
OD-71A6	0.18	900	62%	0.7	0.61	1.95	3	2	2.3	0.00060	7
OD-71B6	0.25	910	63%	0.6	1	2.7	2.9	3.1	3.3	0.00080	7.5
OD-80A6	0.37	940	58%	0.66	1.4	3.76	4	2.7	3.2	0.00220	9
OD-80B6	0.55	930	65%	0.65	2	5.72	2.7	2.3	2.4	0.00282	11
OD-90S6	0.75	930	71%	0.7	2.2	7.9	3.5	2.3	2.4	0.00265	13
OD-90L6	1.1	910	67%	0.75	3.2	11.6	3.7	2.3	2.5	0.00342	16
OD-100L6	1.5	940	78%	0.68	4	15.3	4.1	2.6	2.9	0.01033	22
OD-112M6	2.2	930	78%	0.78	5.2	22.6	5	3.2	3.4	0.01603	37

**750 3 PHASE-1 SPEED** Voltage: 400V 50Hz

Type	Power (kW)	Speed (rpm)	Eff. (%)	Power Factor (Cosφ)	Full Load Amps I <sub>n</sub> (A)	Rated Torque (Nm)	Locked Rotor Current (I <sub>L</sub> /I <sub>n</sub> )	Locked Rotor Torque (M <sub>L</sub> /M <sub>n</sub> )	Breakdown Torque (M <sub>B</sub> /M <sub>n</sub> )	Moment of Inertia (kgm <sup>2</sup> )	Mass Weight (kg)
OD-80A8	0.18	960	49%	0.6	0.95	2.5	2.8	2.7	3	0.00141	10
OD-80B8	0.25	700	55%	0.55	1.2	3.6	2.9	2.8	3.2	0.00251	11
OD-90S8	0.37	680	60%	0.67	1.3	5.2	3	1.6	2	0.00376	13
OD-90L8	0.55	690	65%	0.65	1.9	7.7	3	2.4	2.7	0.00551	15
OD-100K8	0.75	700	65%	0.65	2.6	10	3.4	2.3	2.5	0.00775	20
OD-100L8	1.1	700	63%	0.69	3.6	15.2	3.7	2.2	2.6	0.01033	22
OD-112M8	1.5	710	77%	0.72	3.9	20.2	3.7	1.3	2.2	0.01870	37

**14. ELECTRICAL DATA (IP66) Aluminium (MD Series) (Running Capacitor)**



**3000 SINGLE PHASE • 1 SPEED** Voltage: 230V 50Hz

Type	Power (kW)	Speed (rpm)	Eff. (%)	Power Factor (Cos φ)	Full Load Amps I <sub>n</sub> (A)	Rated Torque (Nm)	Locked Rotor Current (I <sub>L</sub> /I <sub>n</sub> )	Locked Rotor Torque (M <sub>L</sub> /M <sub>n</sub> )	Breakdown Torque (M <sub>br</sub> /M <sub>n</sub> )	Capacitor (μF)	Moment of Inertia (kgm <sup>2</sup> )	Mass Weight (kg)
MD-56B2	0.12	2770	46%	0.95	1.17	0.4	2.3	1	1.9	4	0.00030	4.5
MD-63A2	0.18	2870	55%	0.99	1.5	0.6	2.3	0.6	2.1	12.5	0.00030	5.5
MD-63B2	0.25	2780	60%	0.95	1.8	0.85	2.6	0.6	1.7	12.5	0.00035	6
MD-71A2	0.37	2860	65%	0.95	2.56	1.23	3.6	0.7	2.0	16	0.00046	7.5
MD-71B2	0.55	2840	66%	0.99	3.42	1.85	3.3	0.7	2.0	25	0.00056	8
MD-80A2	0.75	2860	70%	0.99	4.55	2.52	3.8	0.7	1.8	30	0.00097	9.5
MD-80B2	1.1	2880	70%	0.99	6.6	3.7	4.1	0.7	2.0	50	0.01000	11
MD-90S2	1.5	2810	67%	0.99	9.75	5.1	2.7	0.6	1.7	70	0.00150	13
MD-90L2	1.5	2720	69%	0.99	13.9	7.62	2.4	0.7	1.5	90	0.00190	15
MD-100M2	2.2	2850	71%	0.9	15	7.4	3.5	0.55	1.7	100	0.00370	25
MD-100L2	3	2850	66%	0.9	22	10	3.6	0.6	1.8	110	0.00530	27
MD-112M2	4	2890	69%	0.97	26	13.2	3.6	0.65	1.8	120	0.00700	40

**1500 SINGLE PHASE • 1 SPEED** Voltage: 230V 50Hz

Type	Power (kW)	Speed (rpm)	Eff. (%)	Power Factor (Cos φ)	Full Load Amps I <sub>n</sub> (A)	Rated Torque (Nm)	Locked Rotor Current (I <sub>L</sub> /I <sub>n</sub> )	Locked Rotor Torque (M <sub>L</sub> /M <sub>n</sub> )	Breakdown Torque (M <sub>br</sub> /M <sub>n</sub> )	Capacitor (μF)	Moment of Inertia (kgm <sup>2</sup> )	Mass Weight (kg)
MD-56B4	0.09	1420	55%	0.97	0.8	0.59	3.0	0.7	2.1	6.3	0.00038	5
MD-63A4	0.12	1380	55%	0.99	1.07	0.84	2.2	0.7	2.5	8	0.00040	5
MD-63B4	0.18	1360	59%	0.99	1.38	1.27	1.8	0.6	1.2	10	0.00045	5.5
MD-71A4	0.25	1450	59%	0.99	2	1.66	4	0.55	2.5	16	0.00080	8
MD-71B4	0.37	1430	65%	0.99	2.55	2.5	3.1	1.1	1.7	20	0.00090	8.5
MD-80A4	0.55	1440	69%	0.96	3.7	3.7	3.5	0.6	2.0	25	0.00096	10
MD-80B4	0.75	1410	70%	0.99	4.74	5.1	2.6	0.6	1.5	30	0.00120	12
MD-90S4	1.1	1440	68%	0.94	7.6	7.4	3.4	0.5	2	40	0.00260	15
MD-90L4	1.5	1430	69%	0.99	9.6	10.1	2.6	0.5	1.5	45	0.00320	18
MD-100M4	2.2	1415	70%	0.96	15.6	14.9	3.8	0.55	1.6	45	0.00590	25
MD-112M4	3	1430	75%	0.98	20	20	3.9	0.45	1.8	70	0.01200	37

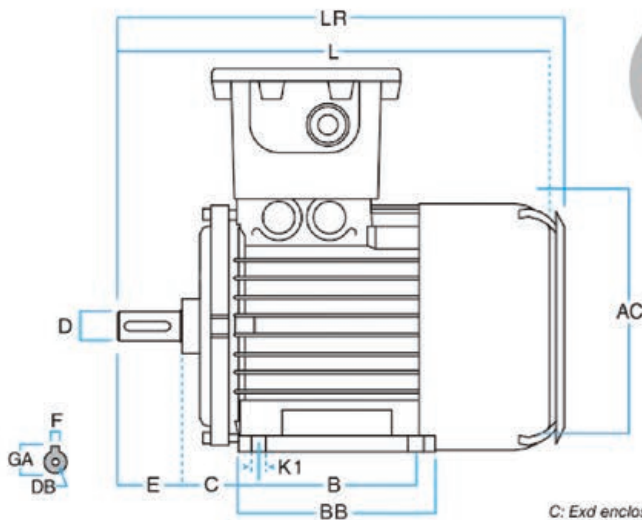
**1000 SINGLE PHASE • 1 SPEED** Voltage: 230V 50Hz

Type	Power (kW)	Speed (rpm)	Eff. (%)	Power Factor (Cos φ)	Full Load Amps I <sub>n</sub> (A)	Rated Torque (Nm)	Locked Rotor Current (I <sub>L</sub> /I <sub>n</sub> )	Locked Rotor Torque (M <sub>L</sub> /M <sub>n</sub> )	Breakdown Torque (M <sub>br</sub> /M <sub>n</sub> )	Capacitor (μF)	Moment of Inertia (kgm <sup>2</sup> )	Mass Weight (kg)
MD-71A6	0.12	910	61%	0.83	1.30	1.2	2.5	0.6	1.4	8	0.00080	8
MD-71B6	0.18	930	61%	0.91	1.60	1.8	2.7	0.6	1.4	12.5	0.00090	8.5
MD-80A6	0.25	920	62%	0.92	2.40	2.2	2.8	0.6	1.4	16	0.00096	10
MD-80B6	0.37	920	65%	0.85	2.90	3.2	2.9	0.7	1.8	20	0.00120	12
MD-90S6	0.55	910	65%	0.85	4.20	5.9	2.9	0.7	1.7	25	0.00260	15
MD-90L6	0.75	920	68%	0.90	5.90	8.1	3.1	0.7	1.9	32	0.00320	18
MD-100M6	1.10	920	69%	0.90	8.10	11.5	3.1	0.7	1.9	45	0.00590	25

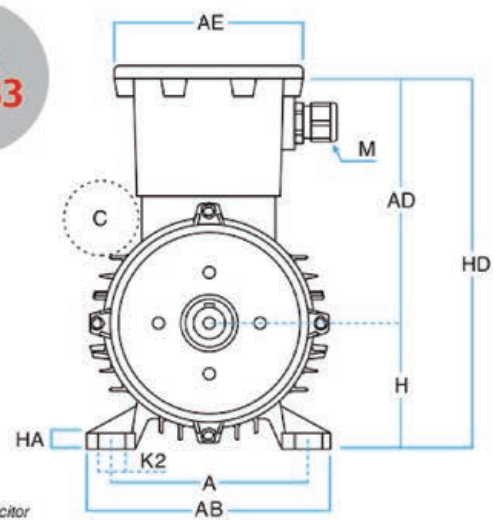
## 15. OVERALL DIMENSIONS (IP66) Aluminium (OD / MD Series)

ATEX

Frame Size	B	A	HA	BB	AB	AC	AD	AE	C	H	HD	L	LR	K1	K2	M	D	E	GA	F	DB
63	80	100	10	105	120	121	150	119	40	63	203	200	210	7	12	M20	11	23	12.5	4	M4X10
71	90	112	11	108	136	136	159	119	45	71	220	225	235	7	12	M20	14	30	16	5	M5X25
80	100	125	11	125	154	154	163	119	50	80	243	245	255	9.5	17.5	M20	19	40	21.5	6	M6X16
90S	100	140	13	130	174	174	173	119	56	90	263	260	270	9.5	17.5	M20	24	50	27	8	M8X19
90L	125	140	13	155	174	174	173	119	56	90	263	285	295	9.5	17.5	M20	24	50	27	8	M8X19
100	140	160	14	175	192	192	186	119	63	100	286	315	327	11.2	21.2	M20	28	60	31	8	M10X22
112	140	190	14	175	224	216	195	119	70	112	307	338	352	11.2	21.2	M20	28	60	31	8	M10X22

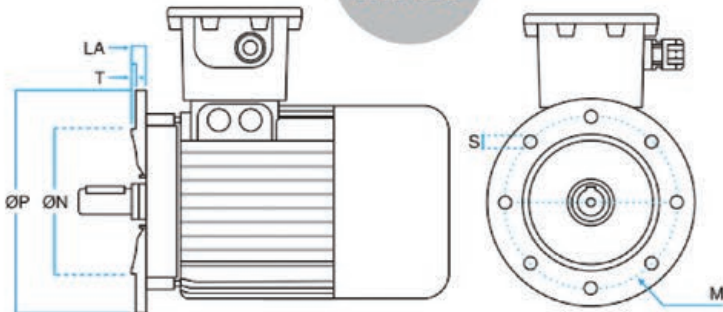


Ex d  
IM B3

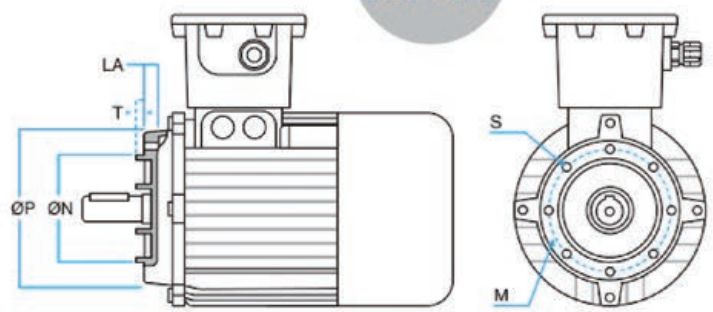


C: Exd enclosure for capacitor

Ex d  
IM B5



Ex d  
IM B14



Frame Size	OP	ON	LA	M	T	S
56	120	80	10.5	100	3	7
63	140	95	10.5	115	3	9
	160*	110	10.5	130	3.5	9
71	140*	95	10.5	115	3	9
	160	110	10.5	130	3.5	9
	200*	130	11.5	165	3.5	12
80	160*	110	10.5	130	3.5	9
	200	130	11.5	165	3.5	12
90	160*	110	10.5	130	3.5	9
	200	130	11.5	165	3.5	12
100	200*	130	11.5	165	3.5	12
	250	180	15	215	4	13
112	200*	110	10.5	130	3.5	9
	250	180	15	215	4	13

Frame Size	OP	ON	LA	M	T	S
56	80	50	13	65	2.5	M5
63	90	60	13	75	2.5	M5
	105*	70	13	85	2.5	M6
71	90*	60	13	75	2.5	M5
	105	70	13	85	2.5	M6
	120*	80	13	100	3	M6
	105*	70	15	85	2.5	M6
80	120	80	15	100	3	M6
	140*	95	15	115	3	M8
	120*	80	15	100	3	M6
90	140	95	15	115	3	M8
	160*	110	16	130	3.5	M8
	140*	95	15	115	3	M8
100	160	110	16	130	3.5	M8
	140*	95	15	115	3	M8
	160	110	16	130	3.5	M8
112	140*	95	15	115	3	M8
	160	110	16	130	3.5	M8

\*Reduced or enlarged flange version

## 16. TERMINAL BOXES

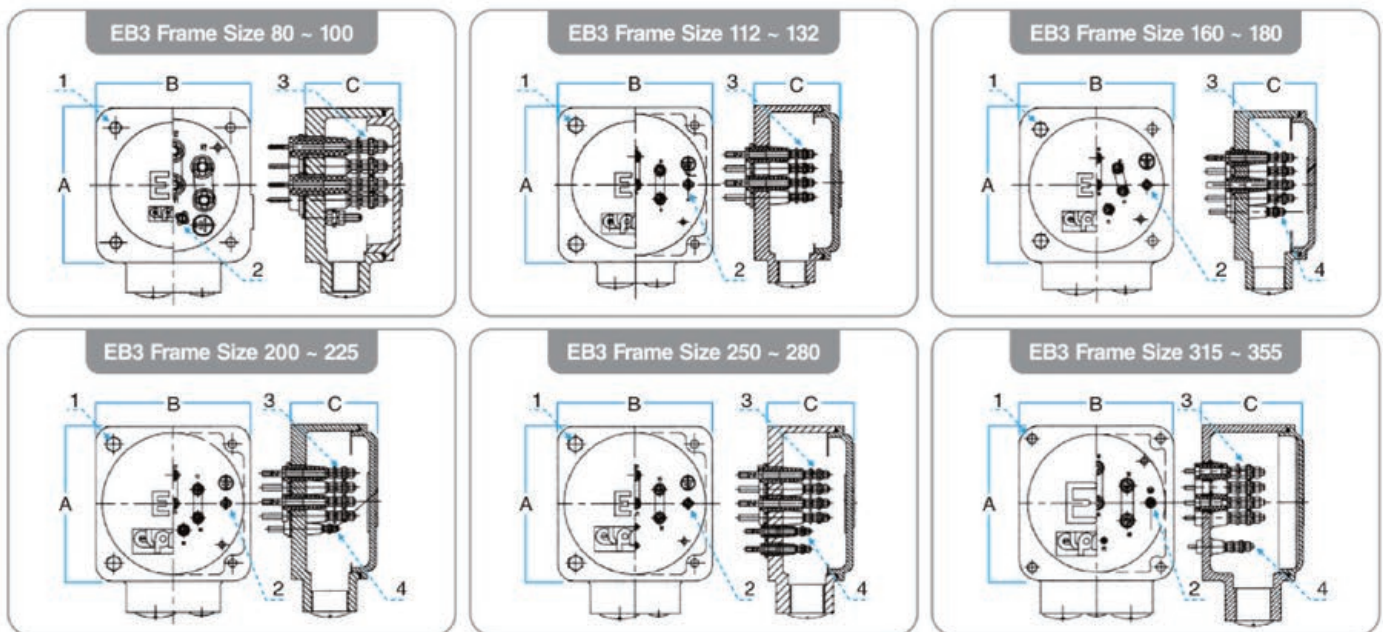
### 16.1 The power supply's connecting terminals number & earthing terminal specification

Type	Connection Terminals	Spec of Connection Terminals	Spec of Earthing Terminals
EB3 80 ~ 112	6	M5	M5
EB3 132 ~ 180	6	M6	M6
EB3 200 ~ 225	6	M8	M8
EB3 250 ~ 280	6	M10	M10
EB3 315 ~ 355	6	M16	M12

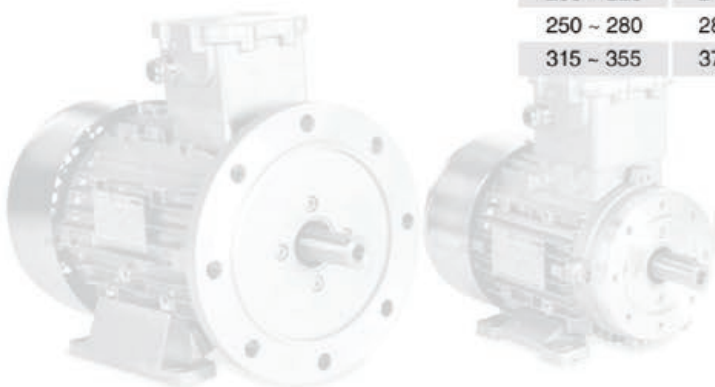
### 16.2 Specification of Terminal Box

Terminal Box	Frame Size	No. of Entry	Inlet's Thread	Scope of Supply
M5	80~100	1	M25X1.5	Normal
M5	112	1	M25X1.5	Normal
M5	132	1	M40X1.5	Normal
M6	160~180	2	M40X1.5 M20X1.5	Normal
M8	200~225	2	M50X1.5 M20X1.5	Normal
M10	250~280	2	M63X1.5 M20X1.5	Normal
M16	315~355	3	2-M63X1.5 M20X1.5	Normal

### 16.3 The structural representation & Schematic diagram of terminal box (EB3)



Type	A	B	C	1	2	3	4
80 ~ 100	138	138	90	M8 X 105	M5	M5	-
112 ~ 132	166	166	100	M8 X 105	M5	M5	-
160 ~ 180	180	180	106	M10 X 125	M6	M6	M5
200 ~ 225	212	212	122	M12 X 135	M8	M8	M5
250 ~ 280	286	286	140	M16 X 165	M10	M10	M5
315 ~ 355	371	371	226	M16 X 240	M12	M16	M5





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